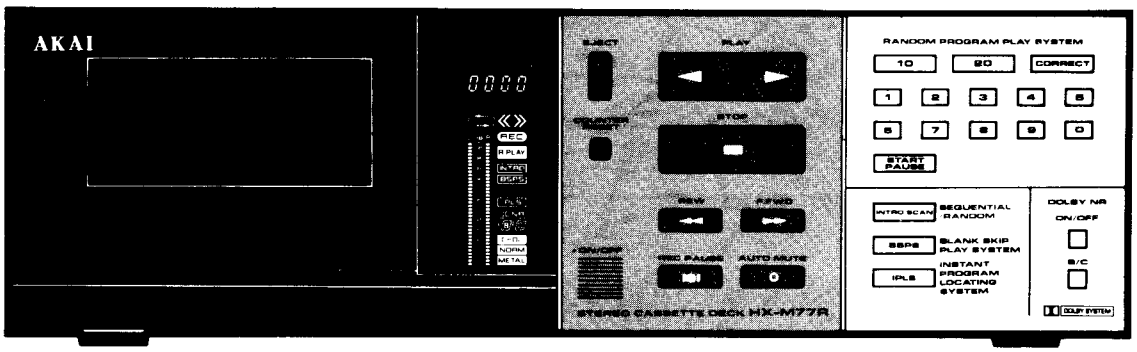
HX-M77R

AKAI SERVICE MANUAL

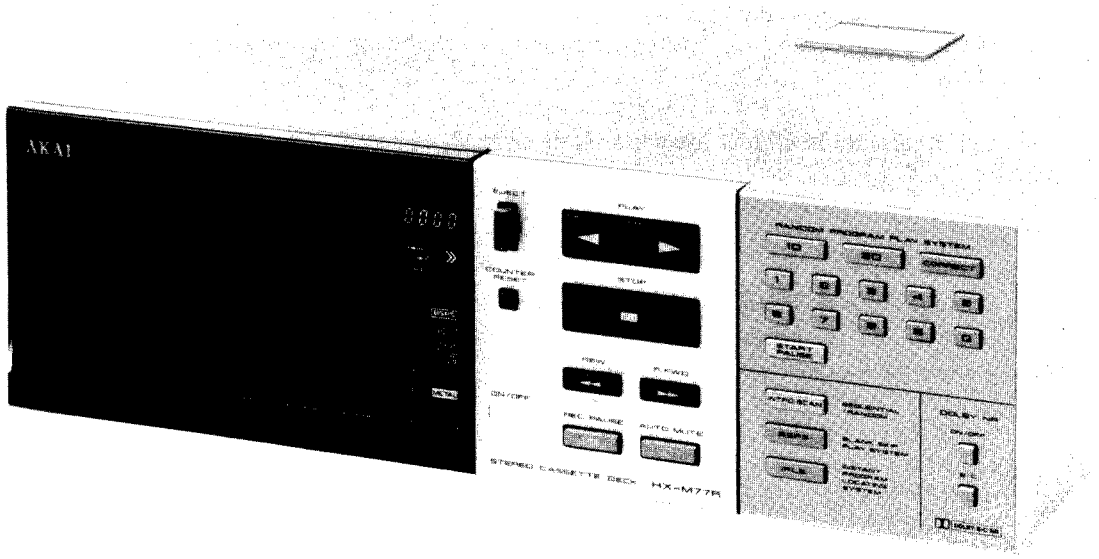


STEREO CASSETTE DECK

MODEL HX-M77R

ABBREVIATIONS FOR SERVICE MANUAL
MODEL HX-M77R

ABBREVIATION	EXPLANATION
AC	Alternating Current
ADJ.	ADJust, or ADJustment
CD	Compact Disc
DAD	Digital Audio Disc
DC	Direct Current
FF	Fast Forward
FL	FLuorescent
FREQ.	FREQuency
FWD	Forward
IPLS	Instant Program Location System
L	Left
MI-COM	MIcroCOMputer
NR.	Noise Reduction
PB	Play Back
PCB	Printed Circuit Board
R	Right
REC	RECord
REV	REVerse
REW	REWind
RPPS	Random Program Processing System
SW	SWitch
SYS-CON	SYStem CONtrol
VR	Variable Resister



STEREO CASSETTE DECK

MODEL HX-M77R

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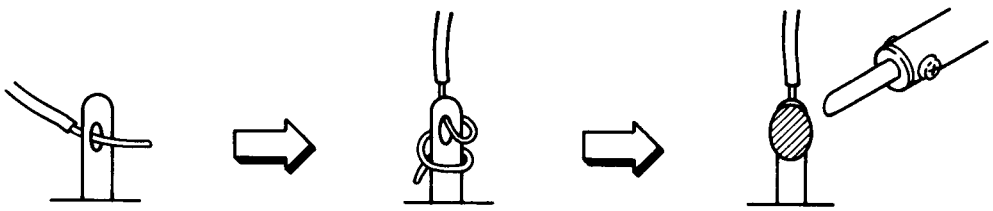
SAFETY INSTRUCTIONS

SAFETY CHECK AFTER SERVICING

Confirm the specified insulation resistance between power cord plug prongs and externally exposed parts of the set is greater than 10 Mohms, but for equipment with external antenna terminals (tuner, receiver, etc.) and is intended for [C] or [A], specified insulation resistance should be more than 2.2 Mohms (ground terminals, microphone jacks, headphone jacks. line-in-out jacks etc.)

PRECAUTIONS DURING SERVICING

1. Parts identified by the ⚠ symbol parts are critical for safety.
   Replace only with parts number specified.
2. In addition to safety, other parts and assemblies are specified for conformance with such regulations as those applying to spurious radiation. These must also be replaced only with specified replacements.
   Examples: RF converters, tuner units, antenna selector switches, RF cables, noise blocking capacitors, noise blocking filters, etc.
3. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads
4. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers (Insulating Barriers)
   4) Insulation sheets for transistors
   5) Plastic screws for fixing microswitch (especially in turntable)
5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.), wrap ends of wires securely about the terminals before soldering.

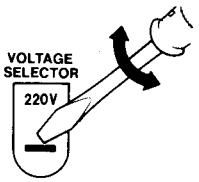


6. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.).
7. Check that replaced wires do not contact sharp edged or pointed parts.
8. Also check areas surrounding repaired locations.
9. Use care that foreign objects (screws, solder droplets, etc.) do not remain inside the set.

VOLTAGE CONVERSION

Models for Japan, Canada, USA, Europe, UK and Australia are not equipped with this facility.
Each machine is preset at the factory according to destination, but some machines can be set to 110V, 120V, 220V or 240V as required.
If VOLTAGE CHANGE is necessary, this can be accomplished as follows:

1. Disconnect power cord.
2. Turn the VOLTAGE SELECTOR located on the rear panel with a screwdriver until the correct voltage is indicated.



CYCLE CONVERSION

Cycle conversion is not necessary since HX-M77R uses DC motors.

SECTION 1

SERVICE MANUAL

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For basic adjustments, measuring methods, and operating principles, refer to GENERAL TECHNICAL MANUAL.

I. SPECIFICATIONS

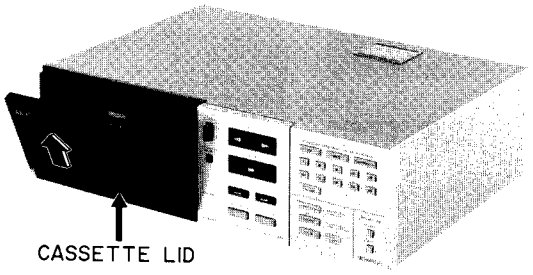
TAPE	Philips type cassette
TRACK	4 Track 2 Channel stereo
HEADS	Erase Head x 1 High Density Head for REC/PB x 1
MOTORS	Electronically speed controlled DC Motor for capstan drive x 1, DC motor for Cam drive x 1
WOW & FLUTTER	0.13% (DIN) 0.05% (W. RMS) ±0.07% W. PEAK (EIAJ)
S/N RATIO	58 dB (Measured via tape with peak recording level, Metal Tape) 56 dB (EIAJ) DOLBY B ON: Improves up to 5 dB 1 kHz, 10 dB above 5 kHz DOLBY C ON: Improves up to 15 dB at 500 Hz, 20 dB at 1 kHz to 10 kHz
DISTORTION	0.75% (METAL)
FREQUENCY RESPONSE	NORMAL: 20 to 16,000 Hz ± 3 dB (−20 VU) CrO_2: 20 to 17,000 Hz ± 3 dB (−20 VU) METAL: 20 to 18,000 Hz ± 3 dB (−20 VU)
INPUT	LINE: 410 mV/70 kohms
OUTPUT	410 mV/Less than 1.5 Kohms
POWER REQUIREMENTS	100V, 50/60 Hz for Japan 120V, 60 Hz for USA and Canada 220V, 50 Hz for Europe except UK 240V, 50 Hz for UK and Australia 110V/120V/220V/240V, 50/60 Hz switchable for other countries
POWER CONSUMPTION	JPN Model: 16W AAL, CSA, U/T Model: 13W
DIMENSIONS	350 (W) x 104 (H) x 255 (D) mm (13.8 x 4.1 x 10.1 inches)
WEIGHT	4.2 kg (9.2 lbs)

* For improvement purposes, specifications and design are subject to change without notice.
* Noise reduction manufactured under license from Dolby Laboratories Licensing Corporation. "Dolby" and the Double-D symbol are trade marks of Dolby Laboratories Licensing Corporation.

II. DISMANTLING OF UNIT

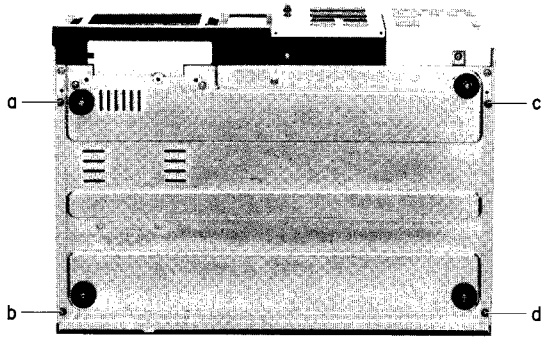
In case of trouble, etc. necessitating dismantling, please dismantle in the order shown in the photographs. Reassemble in reverse order.

1



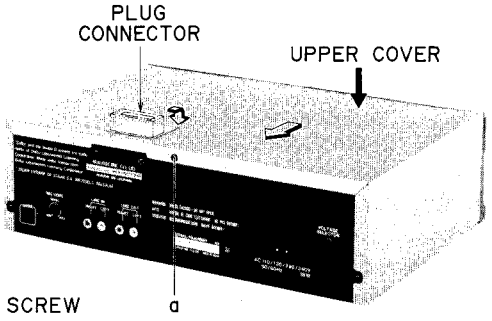
Push EJECT Button and slide LID in direction shown

2



SCREWS

3



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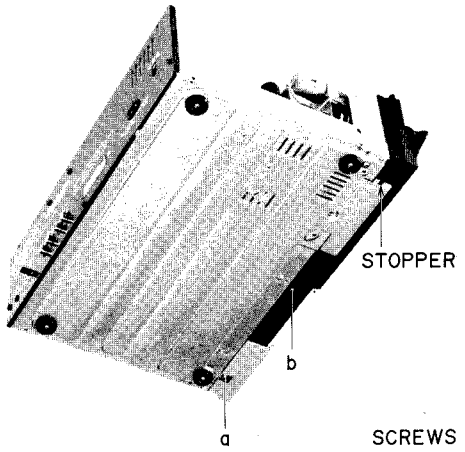

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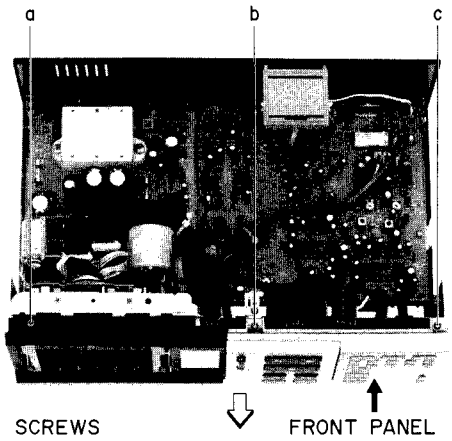

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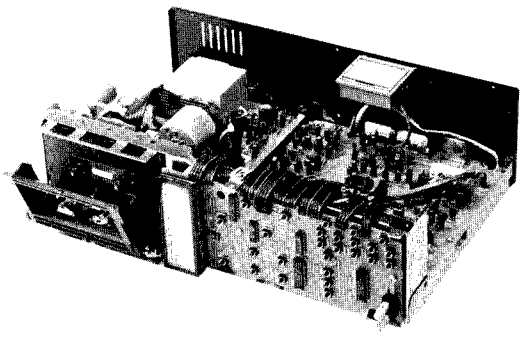
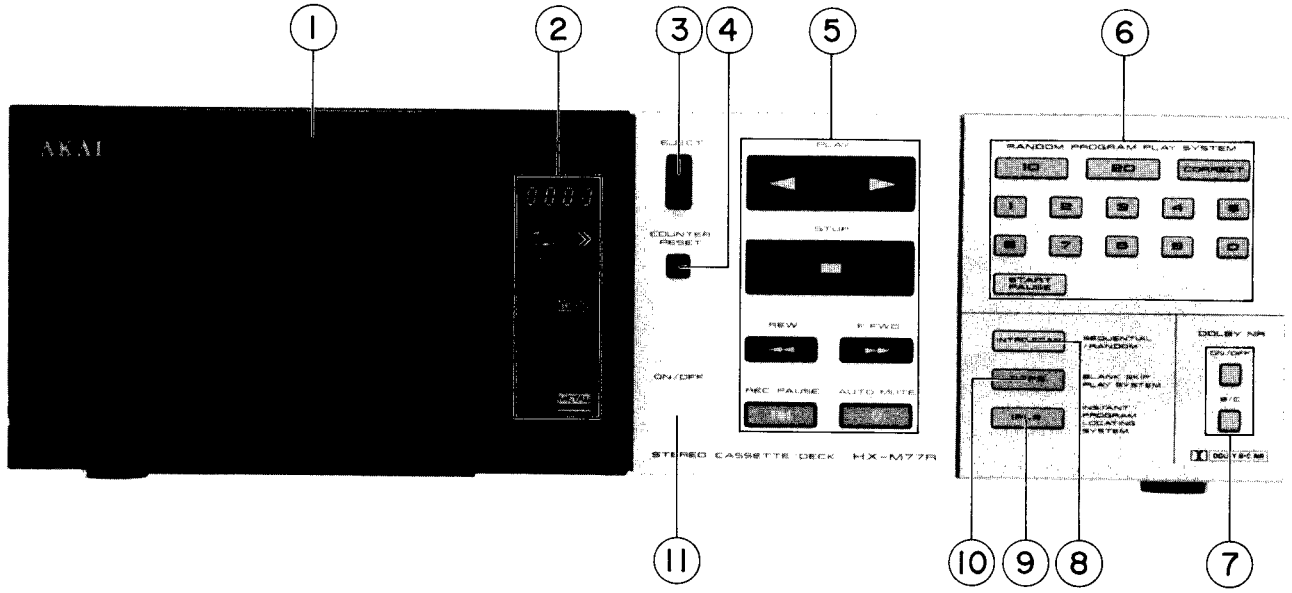


III. CONTROLS



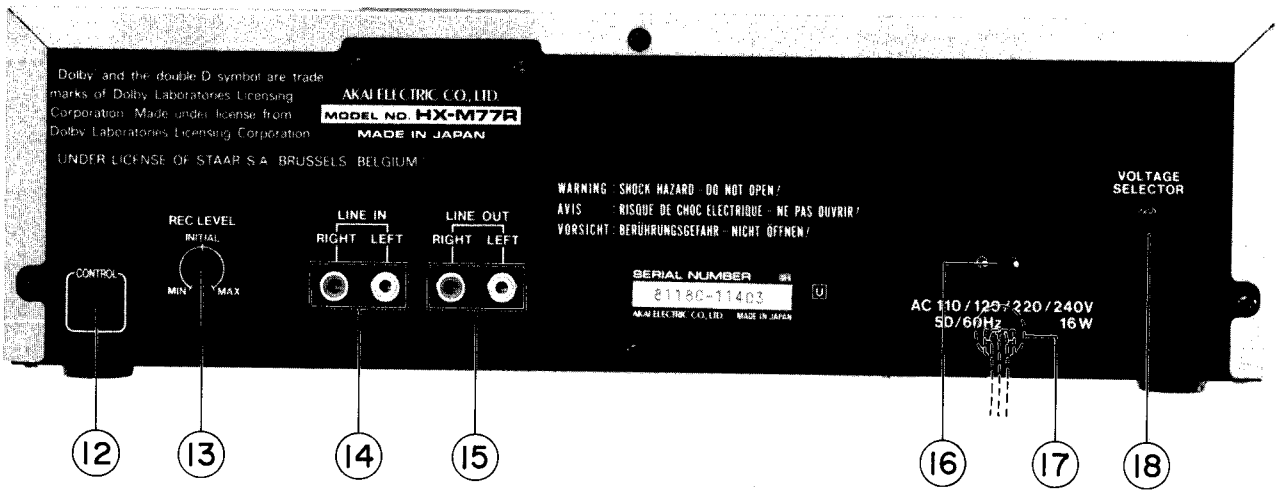


Fig. 3-1

1. CASSETTE LID
2. FL DISPLAY
   (DISPLAY FOR COUNTER, REV MODE, DIRECTION MODE, REC MODE, R. PLAY, INTRO, BSPS, IPLS, DOLBY B/C, TAPE SELECTED & BAR PEAK METER)
3. EJECT BUTTON
4. COUNTER RESET BUTTON
5. OPERATION BUTTONS
   FWD (▶) REV (◀) STOP (■)
   REW (◀◀) F.F (▶▶) REC PAUSE
   (I●I) & AUTO MUTE (●)
6. RPPS PROGRAMING KEY BUTTONS
   (0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, CORRECT & START/PAUSE)
7. DOLBY NR SELECTOR (ON/OFF, B/C TYPE) BUTTONS
8. INTRO SCAN BUTTON
9. IPLS BUTTON
10. BSPS BUTTON
11. FUNCTION BUTTON
12. CONTROL JACK
13. REC LEVEL VR
14. LINE IN PIN JACK
15. LINE OUT PIN JACK
16. AC INLET
    [U] [E] [B] [S] MODELS ONLY
17. POWER CORD
    [J] [C] [A] MODELS ONLY
18. VOLTAGE SELECTOR
    (110V, 120V, 220V, 240V) [U] MODEL ONLY

IV. PRINCIPAL PARTS LOCATION

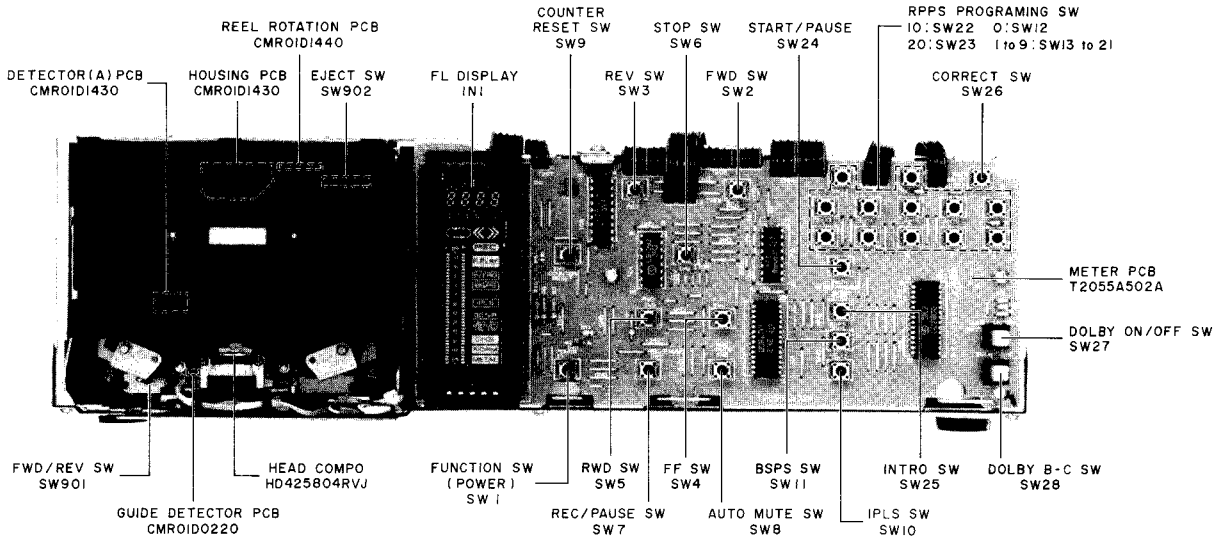


Fig. 4-1

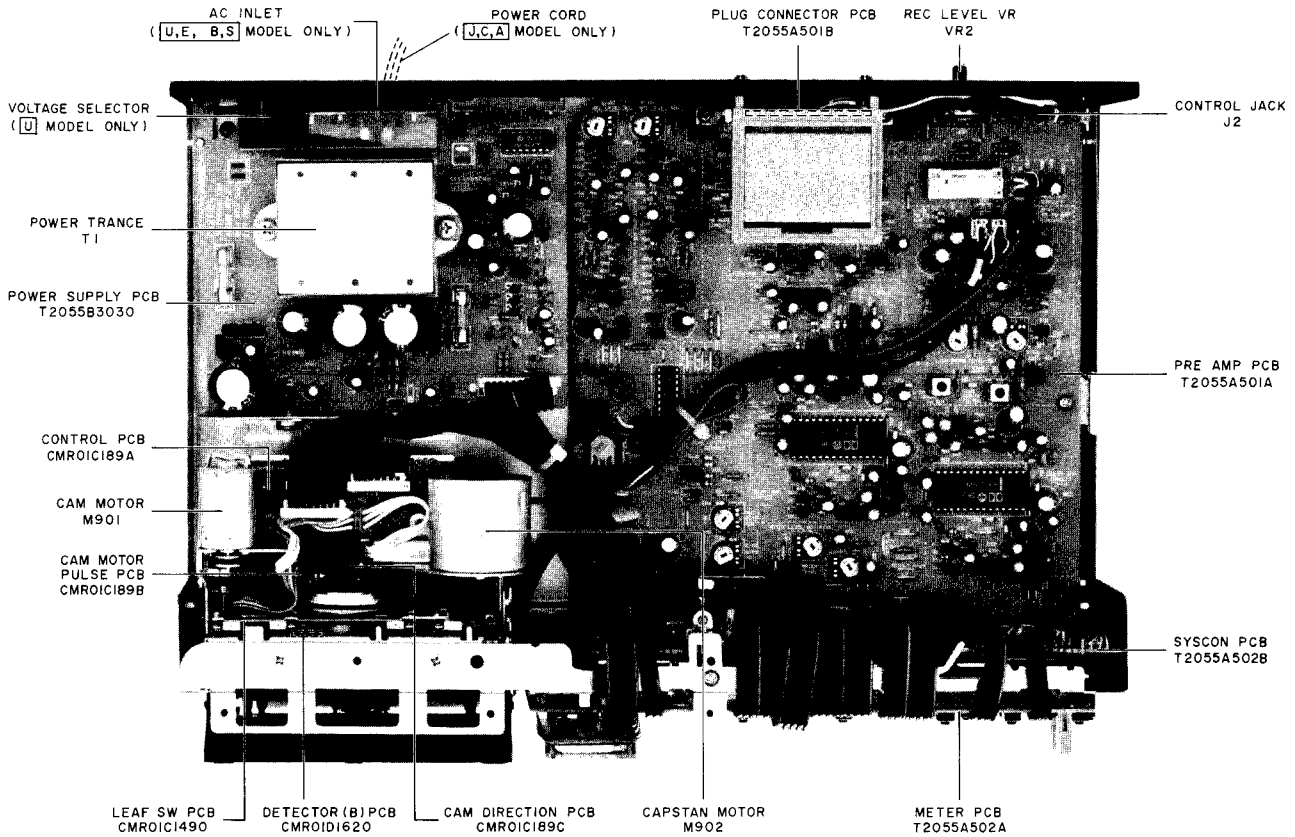


Fig. 4-2

V. MECHANISM OPERATION DESCRIPTION

5-1. DESCRIPTION OF THE MECHANISM DRIVEN BY CAM WHEEL (L) & (R)

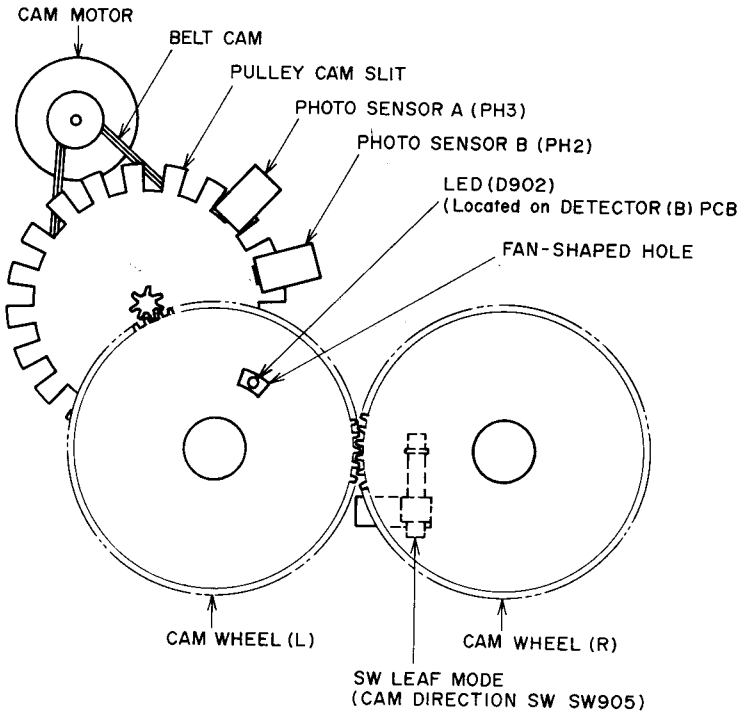


Fig. 5-1 Cam Wheel (L) & (R) Drive Mechanism (Front View)

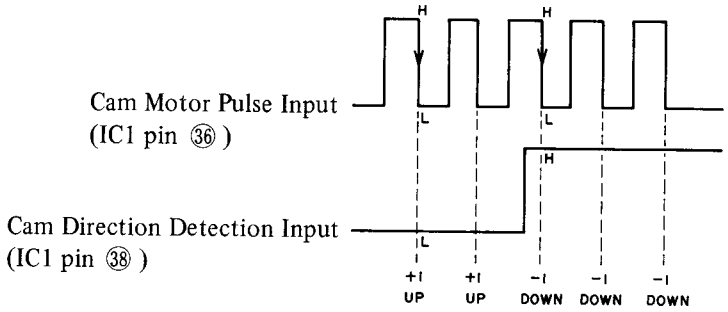


Fig. 5-2

5-1-1. The sequence of this transmission is as follows. (Refer to Fig. 5-1)
CAM MOTOR → BELT CAM → PULEY CAM SLIT → CAM WHEEL (L) → CAM WHEEL (R)

5-1-2. CAM MOTOR is driven by IC2 (BA6109) on SYSCON PCB and this IC2 is controlled by the various control signals from various detectors and switches through the action of MI-COM IC1 (T2055-).

5-1-3. PULLEY CAM SLIT is driven by BELT CAM and drives CAM WHEEL (L), and the slits on PULLEY CAM SLIT are used for the detection of CAM MOTOR PULSE and CAM DIRECTION.

5-1-4. CAM WHEELS (L) (R) contain grooves to shift 8 mechanical parts shown in Figs. 5-5 & 5-6, which execute all the operations such as;
1) Shifting Head block up and down.
2) Shifting Pinch Rollers up and down.
3) Rotation of Reel Tables.
4) Rotation of Head (for FWD & REV modes)

5-1-5. SW LEAF MODE is used for the detection of the current CAM WHEEL position. It is "ON" during REV/FF modes and "OFF" during FWD/REW modes.

5-1-6. DETECTORS A, B are used for the detection of STOP mode. TR902 is "ON" during STOP mode.

5-1-7. PHOTO SENSOR A (PH2) is used for the detection of CAM direction. That part of the CAM MOTOR PULSE in which the pulse changes from "H" to "L" is used for counting up (+) and down (–) as indicated in Fig. 5-2 to set up CAM WHEELS (L) & (R).

5-1-8. PHOTO-SENSOR B (PH3) is used for the detection of CAM MOTOR PULSES, and together with PHOTO-SENSOR B, its count sets up the position of the CAM WHEELS.

5-1-9. Mechanical Operations in each mode

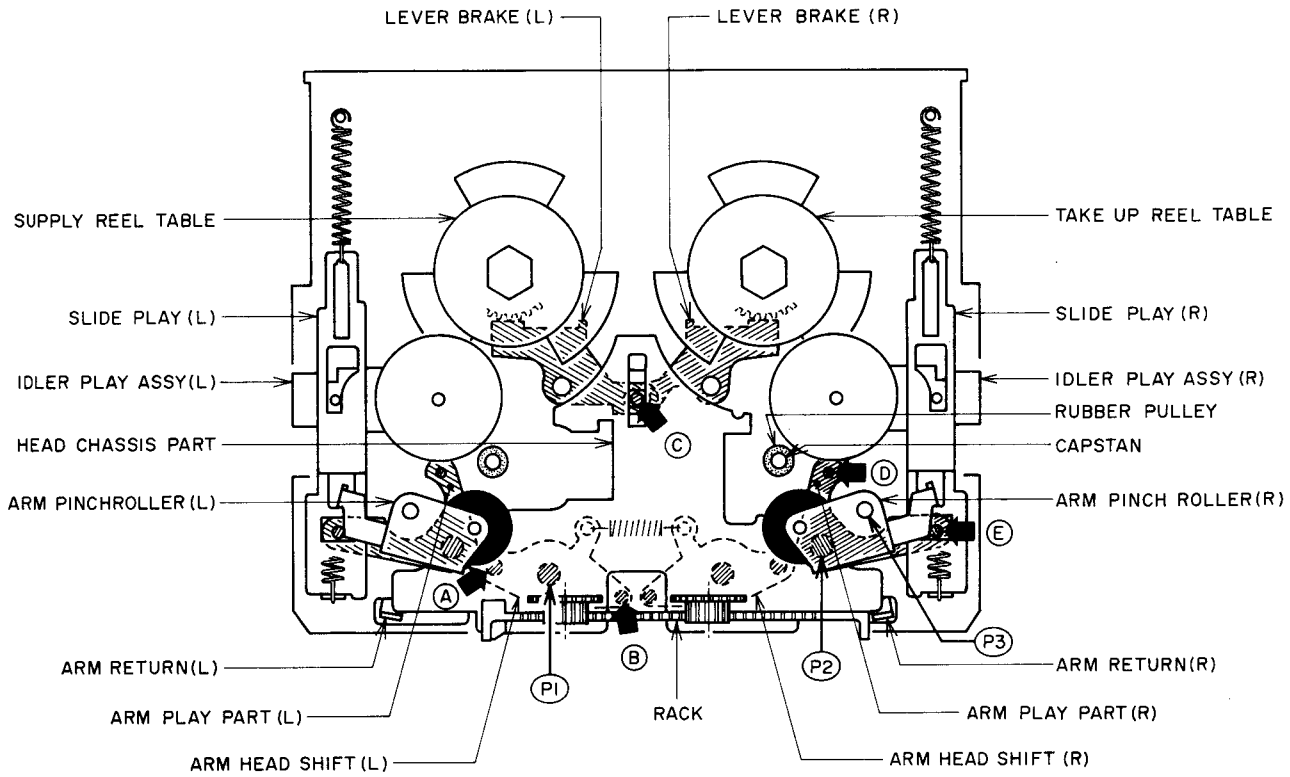


Fig. 5-3 The Mechanism for FWD/REV Mode

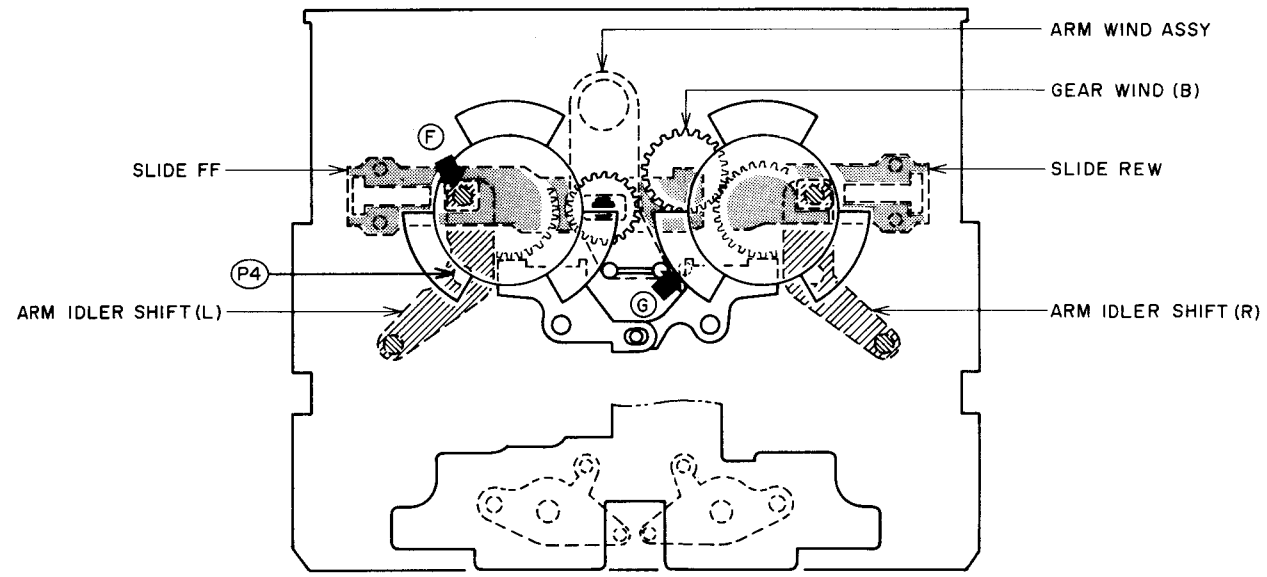


Fig. 5-4 The Mechanism for FF/RWD (includes IPLS & Intro Scan)

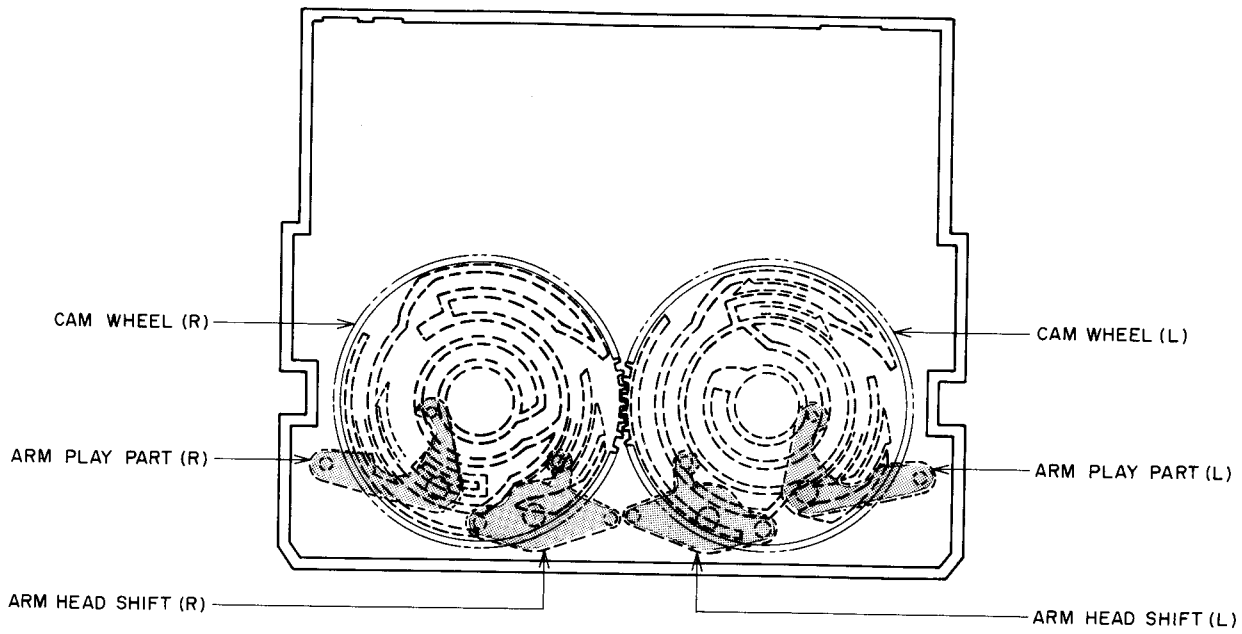


Fig. 5-5 The Location of Arm Head Shift & Arm Play (Inside View)

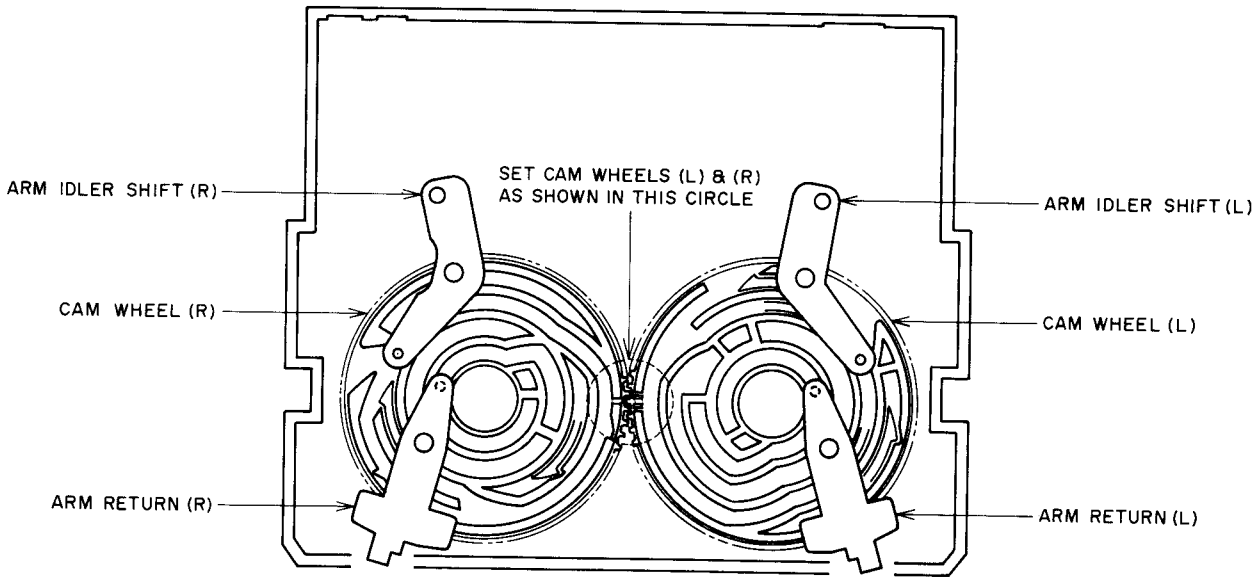


Fig. 5-6 The Location of Arm Idler Shift & Arm Return (Inside View)

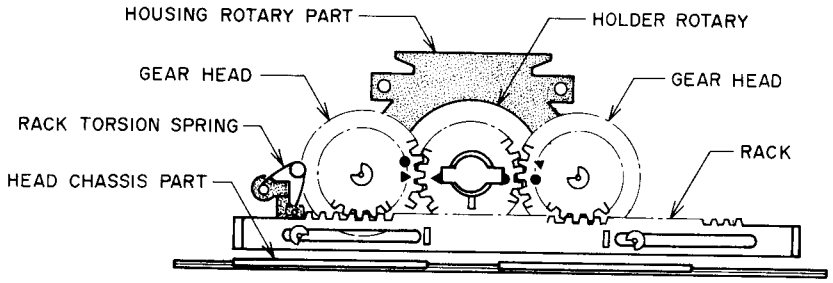


Fig. 5-7 The Bottom View of Rotary Head Mechanism (FWD Mode)

1) FWD mode (Refer to Fig. 5-3)
Cam Wheels (L) & (R) turn clockwise (L) and counter-clockwise (R) for +91 counts in each direction, and put on the brake for 20m sec. (ALL the other modes end with the brake operating for 20m sec as well.)
The mechanical operations in the meantime are as follows.
a) Arm Return (L) moves to the right and pushes Rack in the same direction so that the Rotary head turns into the FWD position.
b) Arm Head Shift (L) turns on its pivot (P1) so Part Ⓐ moves downwards and Part Ⓑ moves upwards. (Part Ⓑ) → pushes Head Chassis up to the position for play mode.
→ pushes Lever Brake (Part Ⓒ) up and release the brake.
c) Arm Play (R) turns on its pivot (P2) so Part Ⓓ moves to the right, and Part Ⓔ moves downwards and pushes Slide Play (R) down so that Idler Play Assy (R) moves to the left and transmits the rotation of the Capstan to the Take-up Reel Table.
At the same time, Arm Pinch Roller (R) turns clockwise on its Pivot (P3) and Pinch Roller (R) comes up for Play mode.

2) REV mode (Refer to Fig. 5-3)
Cam Wheels (L) & (R) turn counter-clockwise (L) and clockwise (R) for the same counts as FWD mode.
The mechanical operations in REV mode can be obtained from the description of FWD mode in item 1) by interchanging left (L) and right (R).

3) FF mode (Refer to Fig. 5-4)
a) Cam Wheels (L) & (R) turn counter-clockwise (L) and clockwise (R) for 43 counts and turn the other way (clockwise (L), counter-clockwise (R)) until the count is reduced to 25.
b) In FF & RWD modes, only Arm Idler Shift (L), (R) are involved.
Arm Idler Shift (L) turns on its pivot (P4) so Part F moves to the right which pushes the Slide FF to the right → Arm Wind Assy moves to the right, engages Gear Wind (B) and transmits the rotation of Arm Wind Assy to Take-up Reel Table.
→ Pushes Lever Brake (R) (Part Ⓖ) to release the brake.

4) REW mode (Refer to Fig. 5-4)
a) Cam Wheels (L) & (R) turn clockwise (L) and counter-clockwise (R) for the same counts as FF mode.
b) The mechanical operations in REW mode can be obtained from the description of the FF mode in item 1) by interchanging left (L) and right (R).

5) FF Search (IPLS, Intro Scan)
a) Cam Wheels turn in the same directions as in FF mode for 51 counts and for the reduction of 25 counts.
b) The mechanical operations in this mode are the same as in FF mode, except that the Arm Head Shift (L) pushes up the Chassis Head Part which raises the Head Block to the FF Search mode position.

6) REW Search (IPLS, Intro Scan)
a) Cam Wheels turn in the same directions as in REW mode for the same counts as in FF search mode.
b) The mechanical operations in this mode are the same as in REW mode, except that the Arm Head Shift (R) pushes up the Chassis Head Part which raises the Head Block to the RWD Search mode position.

5-1-10. How to install Cam Wheel (L) and (R). (Refer to Fig. 5-6)
Set Cam Wheels (L) and (R) as indicated in Fig. 5-6.
The color of Cam Wheel (L) is black and (R) is white, and they rotate around the fulcrum provided by the Capstan Holder Part on the Chassis Mech Part.

5-1-11. The bottom view of Rotary head mechanism.
Refer to Fig. 5-7 when the assembly of this mechanism is necessary.

VI. COMMON BUS SYSTEM FOR CONTROL

Common Bus System (Refer to Fig. 6-1.)
For the network control of direct functions and synchro-recording functions among the tuner, pre-main amp, player, tape deck, CD player, and other individual pieces of equipment, a common bus system operated through serial data transfers has been employed.
The individual components will be joined to a common bus line with connectors in a two-wire configuration of the signal and ground lines.

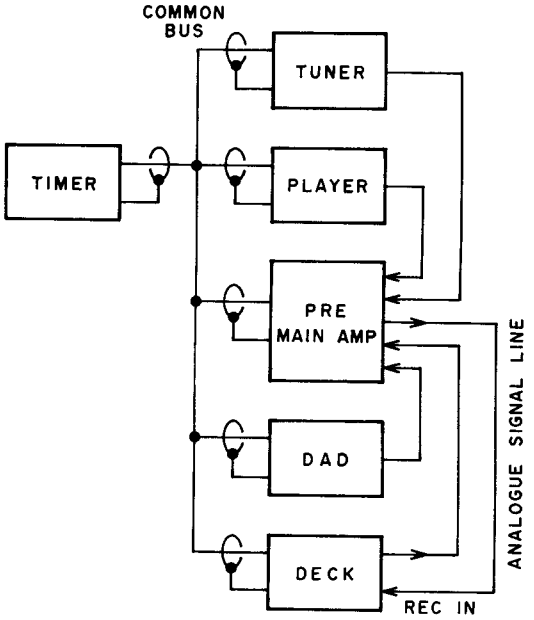


Fig. 6-1

6-1 SERIAL DATA CODE

As shown in Fig. 6-2, the serial data code is composed of the leader code, check code, and the data code.

Leader Code: Selects operating equipment.

Check Code: Provides the check time to prevent collisions of multiple simultaneous signals.

Data Code: Operational Contents.

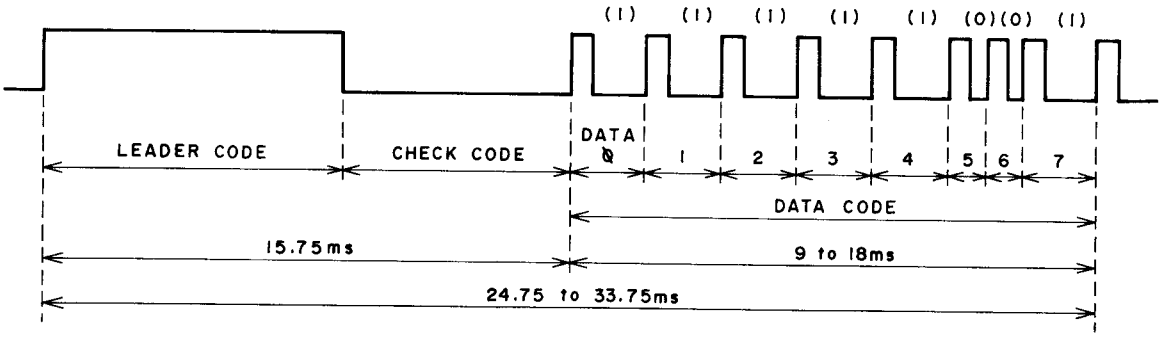


Fig. 6-2

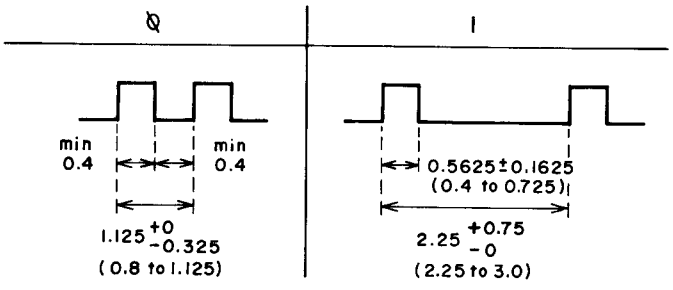


Fig. 6-3

6-2 ALLOCATIONS FOR INDIVIDUAL CODES

6-2-1 Leader Code and Check Code

The individual equipment selecting leader code selects equipment based on the length of its code (Chart 1). With regard to the check code, because the total time for a leader code and a check code put together has been set at 15.75 ms, the remainder after deduction from 15.75 ms of the leader code will be used for the check code.

	Leader Code (ms)	Check Code (ms)
Timer	13.5	2.25
Player	12.375	3.375
DAD (CD)	11.25	4.5
Cassette Deck	9.0	6.75
Tuner	7.875	7.875
Pri-Main Amp.	6.75	9.0

All code lengths will be made n x 1.125 ms.

Chart 1

The leader code with a wider pulse width always shall carry a higher priority than that with a narrower width.

6-2-2 Data Code

For the operational contents of individual equipment, their data shall be structured with combinations of 8 bits, so that 82 kinds of operational contents will be possible.

6-3 DATA TRANSMISSION

1) Upon receiving a key input, the individual component shall check to assure the presence on the common bus (hereinafter, bus) of no data from other components before transmitting its data.
   If any data is present there, not only shall the transmission be called off, but the key input shall also be made ineffective.
2) When no adta is present on the bus, a prescribed leader code shall be output.
3) Upon concluding the output of a leader code, the bus shall be lowered to 'L', and the signal status on the bus checked again. If at that point, data is present on the bus, a higher priority component will have been outputting data, so that the transmission shall be called off.

NOTES: 1. In the case of a key input requiring data transmission, a key acknowledging mode shall be engaged only after confirming in advance the feasibility of sending the data.
2. An interval of 50 μsec min. shall be provided after the lowering to 'L' before checking the bus (Fig. 4).

4) After the prescribed length of a check code, the 8-bit data code section shall be output.
5) An interval of 100 msec min. shall be provided after a burst of transmission before transmitting the next data.

6-4 DATA RECEPTION

1) The component specified by the pulse of a leader code section shall enter a receiving mode. Once the receiving mode is engaged, control signals through the bus shall take precedence, and key inputs shall be inhibited. Even when the receiving mode has been engaged immediately after a key acknowledgement, the key input shall be disregarded.
2) Even after a key input has been acknowledged and its processing already started, or when bus data arrives in the middle of a mechanism operation, bus data shall still be acknowledged. Only, processing of the bus data shall be executed after conclusion of such ongoing operations. Accordingly, the transmitting side shall not check for the verification as to whether the data has been received.
3) An interval of 100 msec min. shall be provided when transmitting data after receiving bus data.
4) When transmission and reception have overlapped, a receiving mode shall be engaged during the check code section of the transmission, and sustained thereafter.
5) The leader code length shall be so selected for the prevention of noise caused malfunctions that when no signal arrives for a prescribed length of time (20 to 40 msec), the receiving mode will be disengaged. A similar arrangement shall also be made for the reading of code sections.

6-5 WHEN THE TIMINGS FOR TRANSMISSION AND RECEPTION HAVE COINCIDED WITH EACH OTHER

When at the timing for an intended transmitting operation, data has been sent out on the bus by another component, the bus data shall be read, and 100 msec later, the intended data transmitted.
However, when upon reading the data, the data transmission is found to be no longer required, the transmission shall be called off.
The 100 msec interval is required for these purposes, and when processing of the data read or equivalent requires more time than 100 msec, a longer than 100 msec interval may also be provided.

6-6 COLLISION PREVENTION ON COMMON BUS LINE

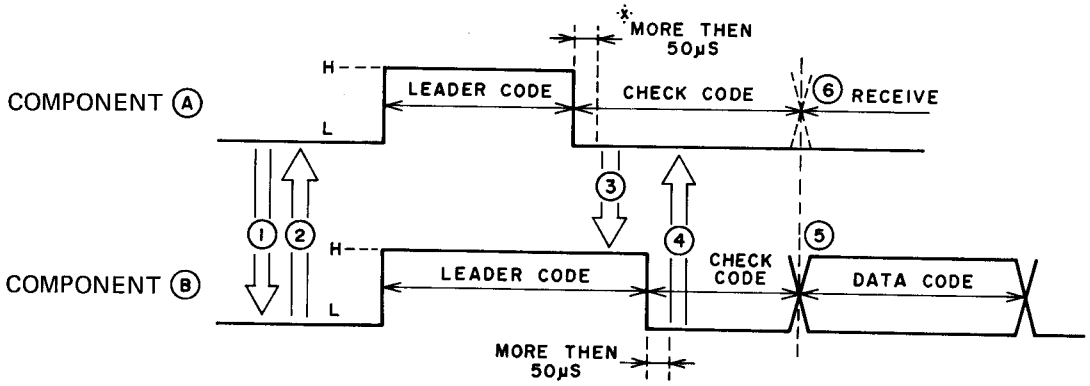


Fig. 6-4

1) After checking for the presence of no data on the bus line, component Ⓐ outputs a leader code.
2) Component Ⓑ also outputs a leader code after checking for the presence of no data.
3) During the check code that follows output of the leader code, component Ⓐ checks the bus line, and finding the component Ⓑ data (leader code) there, will call off its transmission.
4) During the check code that follows output of leader code, component Ⓑ checks the bus line for the presence of data on it.
5) Finding no data on the bus line, component Ⓑ outputs a data code into the bus line.
6) Component Ⓐ enters a receiving mode at the beginning of the data code.

*1 When checking the bus line busy status after the output of a leader code, a 50 μs min. interval shall be provided to avoid reading its own leader code that may be delayed in being output by a time lag within the devices employed.

VII. MECHANICAL ADJUSTMENT

7-1 PINCH ROLLER PRESSURE MEASUREMENT (Refer to Fig. 7-1)

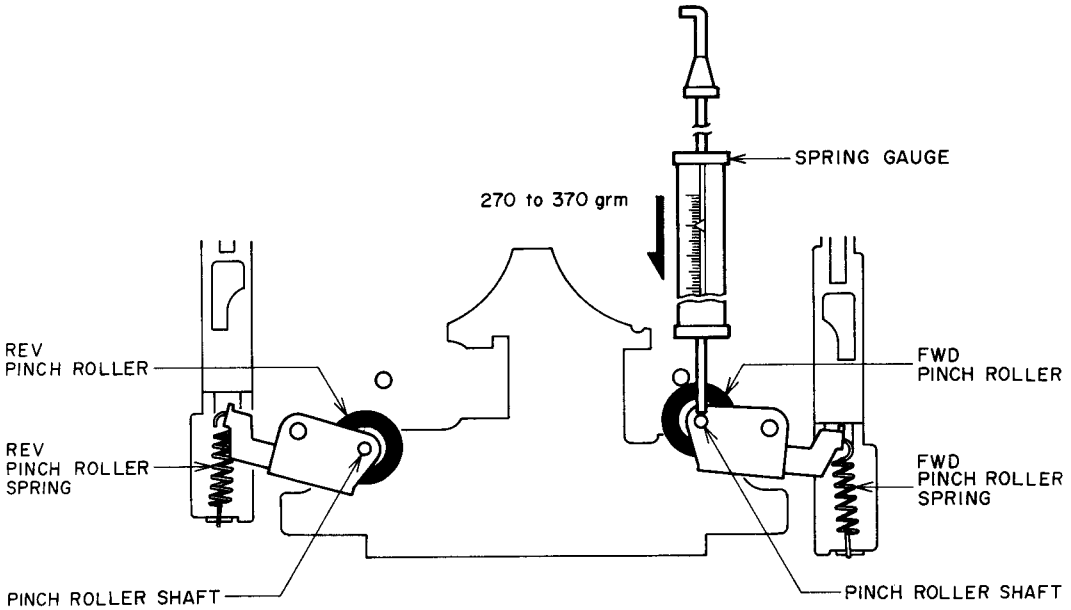


Fig. 7-1

Put in FWD PLAY Mode. Push pinch roller shaft down with the spring gauge, and push the pinch roller 1 to 2 mm away from the capstan and release slowly.
Read the spring gauge at the moment the pinch roller touches the capstan and begins to rotate. Specified contact pressure measurement is 270 to 370 grams.
If the correct measurement is not obtained, replace the pinch roller spring. Do the same for the reverse side.

7-2 WINDING TORQUE MEASUREMENT IN EACH MODE (Refer to Fig. 7-2)

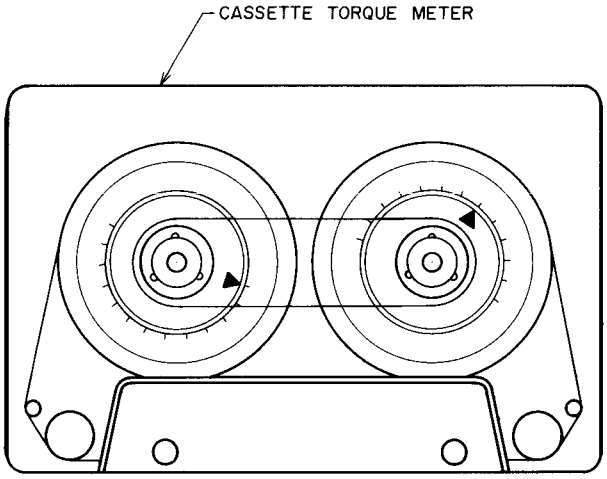


Fig. 7-2

Insert a cassette torque meter (AJ-751179) and measure in each mode.
For Fast Forward and Rewind, measure at the end of the tape when the tape has stopped running.
Forward or Reverse mode
Take up Torque: 25 to 45 g-cm
Back Tension Torque: 2 to 5 g-cm
Fast Forward or Rewind mode
Take up Torque: 70 to 150 g-cm

7-3 TAPE SPEED ADJUSTMENT (Refer to Fig. 7-3)

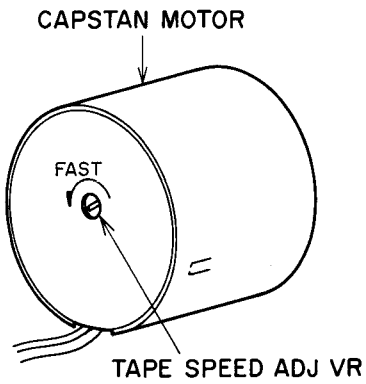


Fig. 7-3 Location of Tape Speed Adjustment Variable Resistor

Connect a frequency counter to Line Output terminal. Playback a 1,000 Hz pre-recorded Test Tape (AT-750744), or 3,150 Hz pre-recorded Test Tape (AT-751263), and adjust the Tape Speed Adjustment Variable Resistor to obtain a tape speed of 1002 ± 3 Hz, or 3155 ± 10 Hz.

VIII. HEAD ADJUSTMENT

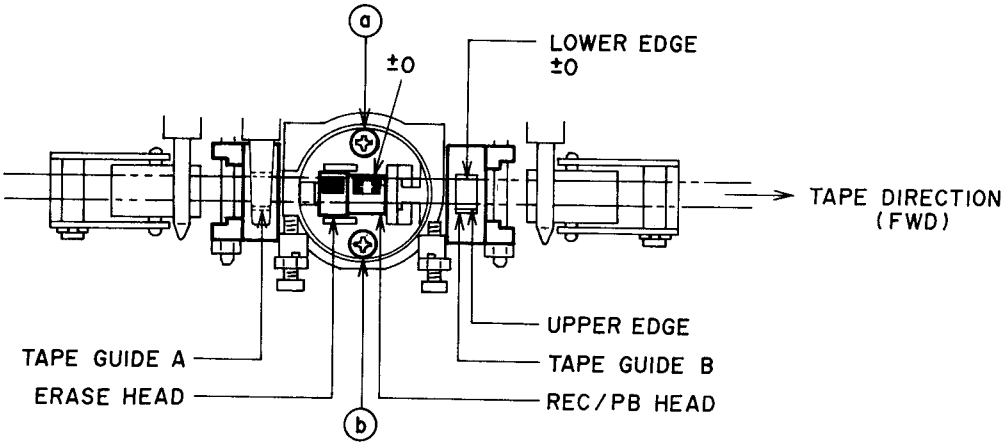


Fig. 8-1

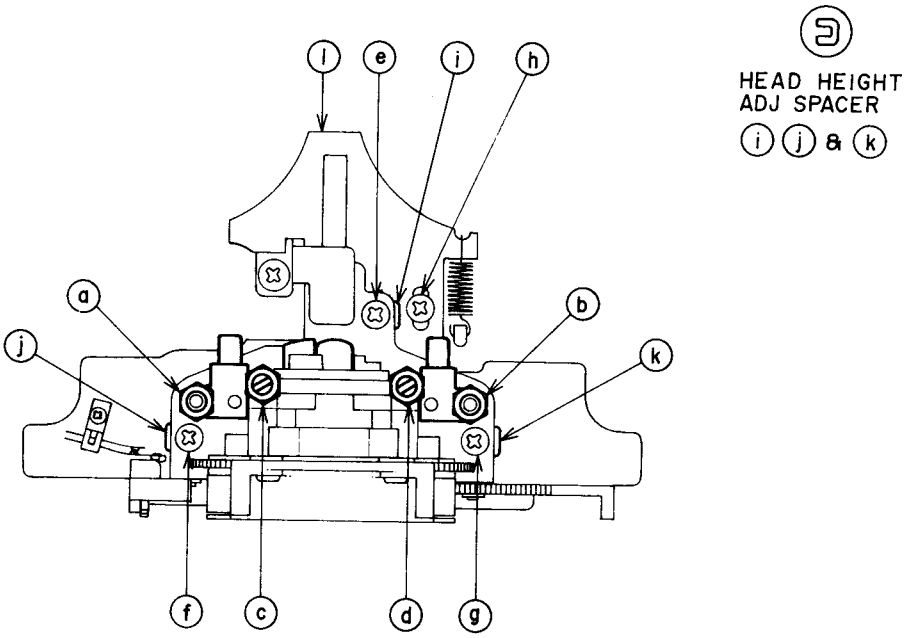


Fig. 8-2

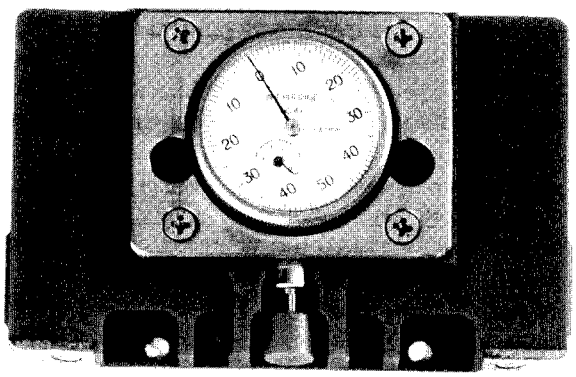


Fig. 8-3 Cassette Head Projection Gauge (TF-111CJ)

Fig. 8-4 Mirror Cassette Tape (MC-112C)

8-1 TAPE GUIDE ADJUSTMENT (Refer to Figs. 8-1, 8-2 & 8-4)

1) Use a Mirror Cassette Tape (AT-751178) for better visibility of the head area, and select PLAY mode.
2) Adjust the tape guides A and B by turning the tape guide height adjustment nuts ⓐ and ⓑ in Fig. 8-2, so that the upper edge of the tape runs smoothly by the adjacent edge of both tape guides, and the tape is not hitched by those tape guides.

8-2 REC/PB HEAD AZIMUTH ADJUSTMENT (Refer to Fig. 8-2)

Playback a 10 kHz Head Azimuth Adjustment Tape (AT-750778) and adjust the screws ⓒ (FWD direction) and ⓓ (REV direction), so that the levels of both channels are maxima. (Note: Avoid turning the screws too far as other false maxima exist further away on both sides of the correct position.)

8-3 HEAD HEIGHT ADJUSTMENT (Refer to Figs. 8-1 & 8-2)

This adjustment is not necessary since this model HX-M77R is equipped with Rotary Head System (with Erase & REC/PB combination head). However, the confirmation of head height is necessary and it can be done as follows.

1) Confirm the azimuth in item 8-2.
2) Playback a 315 Hz (or 333 Hz) PB level Adjustment Tape (AT-750773) in FWD Play mode, and adjust the PB level Adjuster (VR1 on Pre Amp PCB) so that the LINE OUT level of left channel is −5.5 dBm.
   Then, check the level of the same channel in REV mode. The difference in level between FWD and REV modes should be within ±1 dBm. (−4.5 dBm to −6.5 dBm)
3) If the difference is more than ±1 dBm in item 2), adjust the tape guides A & B by turning both Tape Guide Height Adjustment Screws ⓐ & ⓑ in the same direction by 1/4 turn (±0.1 mm), so that difference is within ±1 dBm.
4) The Head Height Adjustment is necessary if still the difference could not be corrected by above adjustment. It can be done by changing the Head Height Adjustment Spacers ⓘ ⓙ & ⓚ. (The thicknesses of these spacers are i = 0.45 mm, ⓘ & ⓚ = 0.3 mm).
   Loosen the screws ⓔ ⓕ & ⓖ for the spacer replacement.
   If the level is lower in REV mode, it means that the head is too high, therefore replace the spacers by thinner ones. When the level is higher in REV mode, replace them by thicker ones.
   After the replacement of those spacers, do the same adjustment in item 1) and check the level of LINE OUT is −5.5 dBm ± 1 dBm.
   For the further confirmation, playback a 4 Track head Height Adjustment Tape (1 kHz/4 Track, AT-750775). Line Output level of both channels should be more than −8 dBm and the difference in level between FWD and REV modes should be within ±1 dBm. Otherwise do the fine adjustment in the same manner as item 3) & 4).
5) When the head replacement is necessary, loosen only the screws ⓐ & ⓑ in Fig. 8-1 for easy replacement.

8-4 HEAD BLOCK PROJECTION ADJUSTMENT (Refer to Figs. 8-2 & 8-3)

Use a Cassette head Projection Gauge (AT-751180) and select FWD or REV play mode.
Loosen the screw ⓗ and adjust Chassis Head Part ⓛ so that the gauge indication at the time is $3.2 \pm \frac{0.15}{0.05}$ mm.
After the adjustment, apply paint-lock on the screw ⓗ.

IX. ELECTRICAL ADJUSTMENT

9-1 PRE AMP P.C BOARD ADJUSTMENT

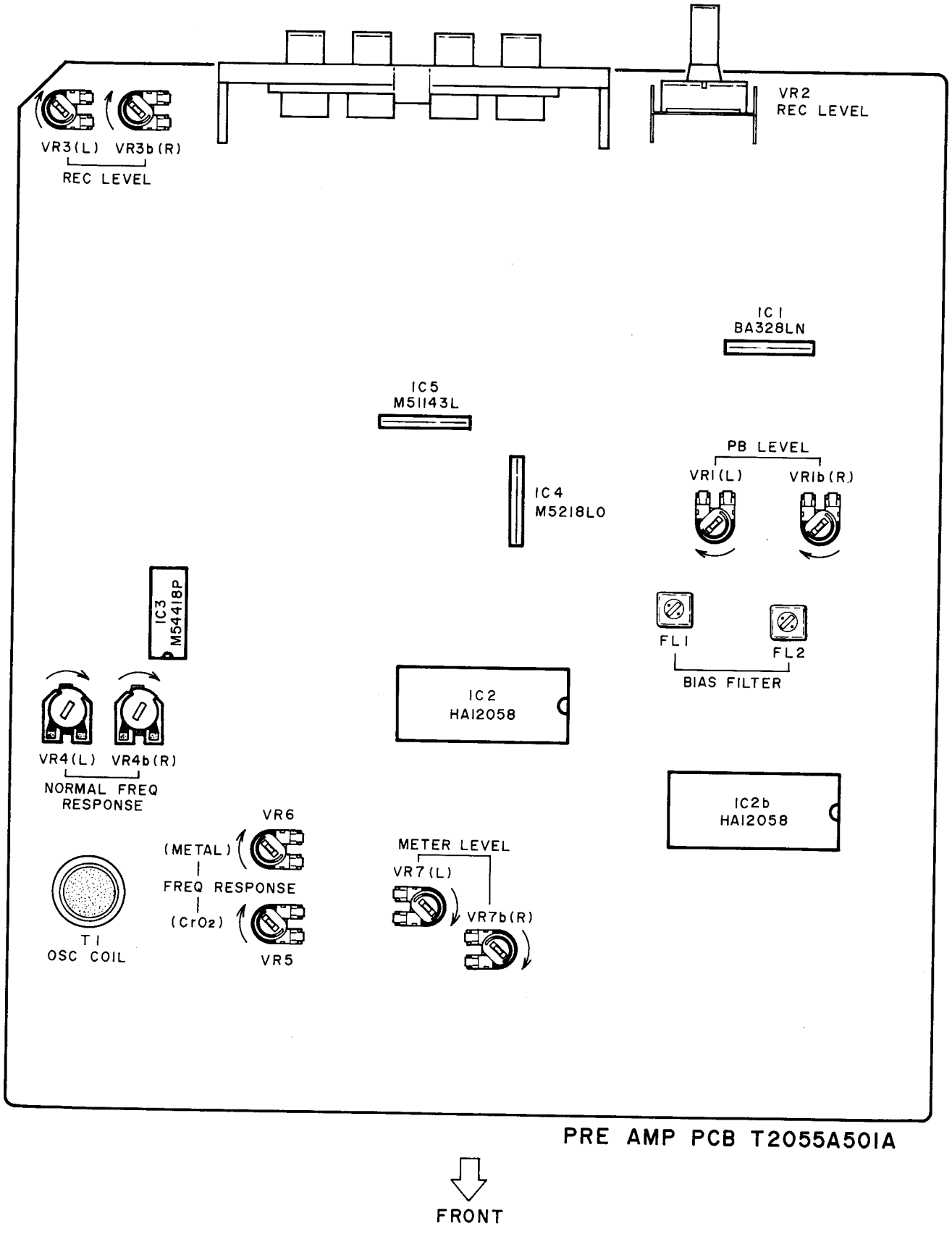


Fig. 9-1 Pre-Amplifier Adjustment Point

Step	Adjustment Item	Test Tape & Supply Signal	Mode	ADJ. Parts	Results	Remarks
1	PB Level	333 Hz (AT-750773) or 315 Hz (AT-750773)	FWD PLAY	VR1 (50K)	−6.1 dBm ± 0.2 dBm (385 mV) −5.5 dBm ± 0.2 dBm (410 mV)	−6.1 dBm ± 1.0 dBm at REV mode −5.5 dBm ± 1.0 dBm at REV mode (See Note 1, 4)
2	Normal Position Frequency Response	Normal Blank Tape 1 kHz, 10 kHz −25.5 dBm	FWD REC/PB	VR4 (100K)	1 kHz, 10 kHz Flat ± 0.5 dBm	
3	CrO_2 Position Frequency Response	CrO_2 Blank Tape 1 kHz, 10 kHz −25.5 dBm	FWD REC/PB	VR5 (20K)	1 kHz, 10 kHz Flat ± 0.5 dBm	
4	Metal Position Frequency Response	Metal Blank Tape 1 kHz, 10 kHz −25.5 dBm	FWD REC/PB	VR6 (3K)	1 kHz, 10 kHz Flat ± 0.5 dBm	
5	REC Level	Normal Blank Tape 1 kHz, −5.5 dBm	FWD REC/PB	VR3 (20K)	−5.5 dBm ± 0.3 dBm (410 mV)	See Note 5.
6	Bias Filter	Metal Blank Tape No Signal Input	REC/ PLAY or REC/ PAUSE	FL1	Minimum Output	Set REC LEVEL to maximum.
7	Meter Level	1 kHz to Line In	REC/ PAUSE	VR7 (20K)	0 VU light at −5.9 dBm and 0 VU extinguishes at −6.0 dBm	

NOTES:
1. Above adjustments except for Step 6, 7 are all at FWD mode, and these adjustments at REV mode are not necessary, but the confirmation of each step at REV mode should be made.
2. Adjustment should be made with Dolby N.R. at OFF position.
3. Use only the tapes recommended for each adjustment.
   NORMAL Tape: MAXELL UD C-60
   CrO_2 Tape: TDK SA C-60
   METAL Tape: TDK MA C-60
4. Confirm that the Metal level Volume (VR7) is positioned left side from the center as shown in Fig. 9-2.
5. Set the REC level Volume (VR2) located on the Rear Panel to the center click position.

Fig. 9-2

9-2 SYSCON P.C BOARD ADJUSTMENT

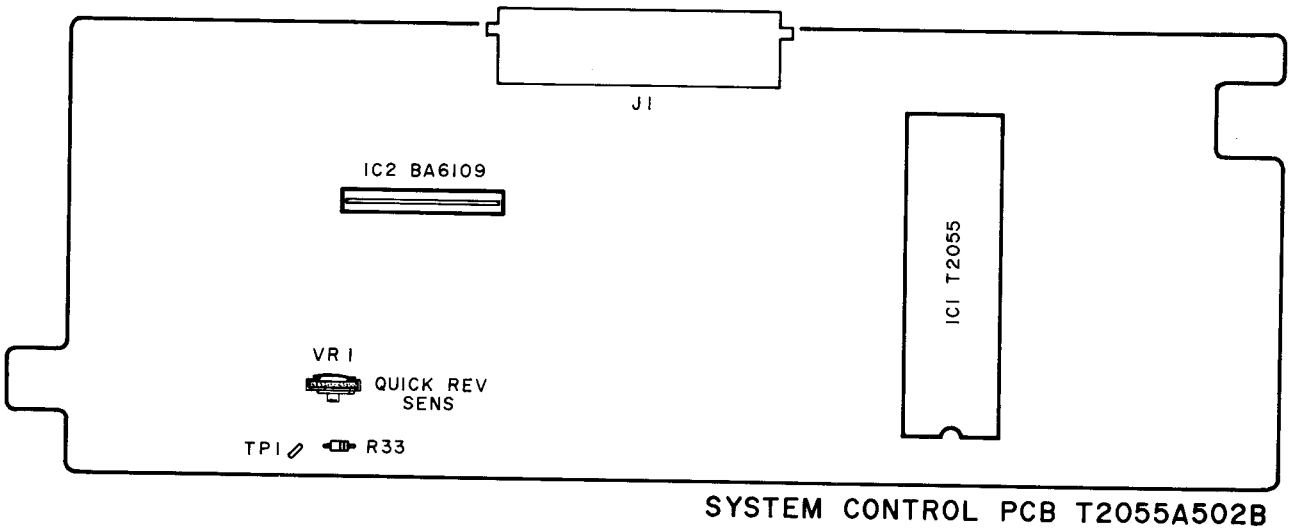


Fig. 9-3 Syscon P.C Board Adjustment Point

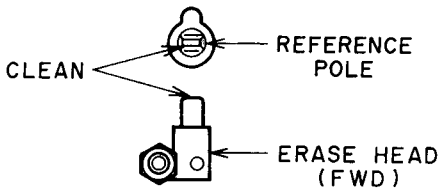


Fig. 9-4

Step	Adjustment Item	Test Tape Supply Signal	Mode	ADJ Parts	Check Point	Results	Remarks
1	Quick Reverse Sensitivity	White empty Cassette pack (See Note 2)	FWD PLAY	VR1 (1M)	TP1	12V ± 0.5V (See Note 3)	Connect a Digital Volt-meter between TP1 and Ground

NOTES: 1. Refer to Figs. 9-3 & 9-4 for these adjustments.
2. Make a tapeless cassette pack by removing the tape from the white colored cassette tape.
3. Clean the Reference Pole and the Detector Tape Guide prior to this adjustment. (Refer to Fig. 9-4)
In case Step 1 is out of adjustment (the voltage does not go up to 12V), remove R33 (150 Kohm) and adjust VR1 so that the voltage is 12V ± 0.5V.
Otherwise, replace the Detection Tape Guide.

X. DC RESISTANCE OF HEADS

Description	DC Resistance
REC/PB HEAD	360 ohms ± 25%
ERASE HEAD	3.5 Ohms

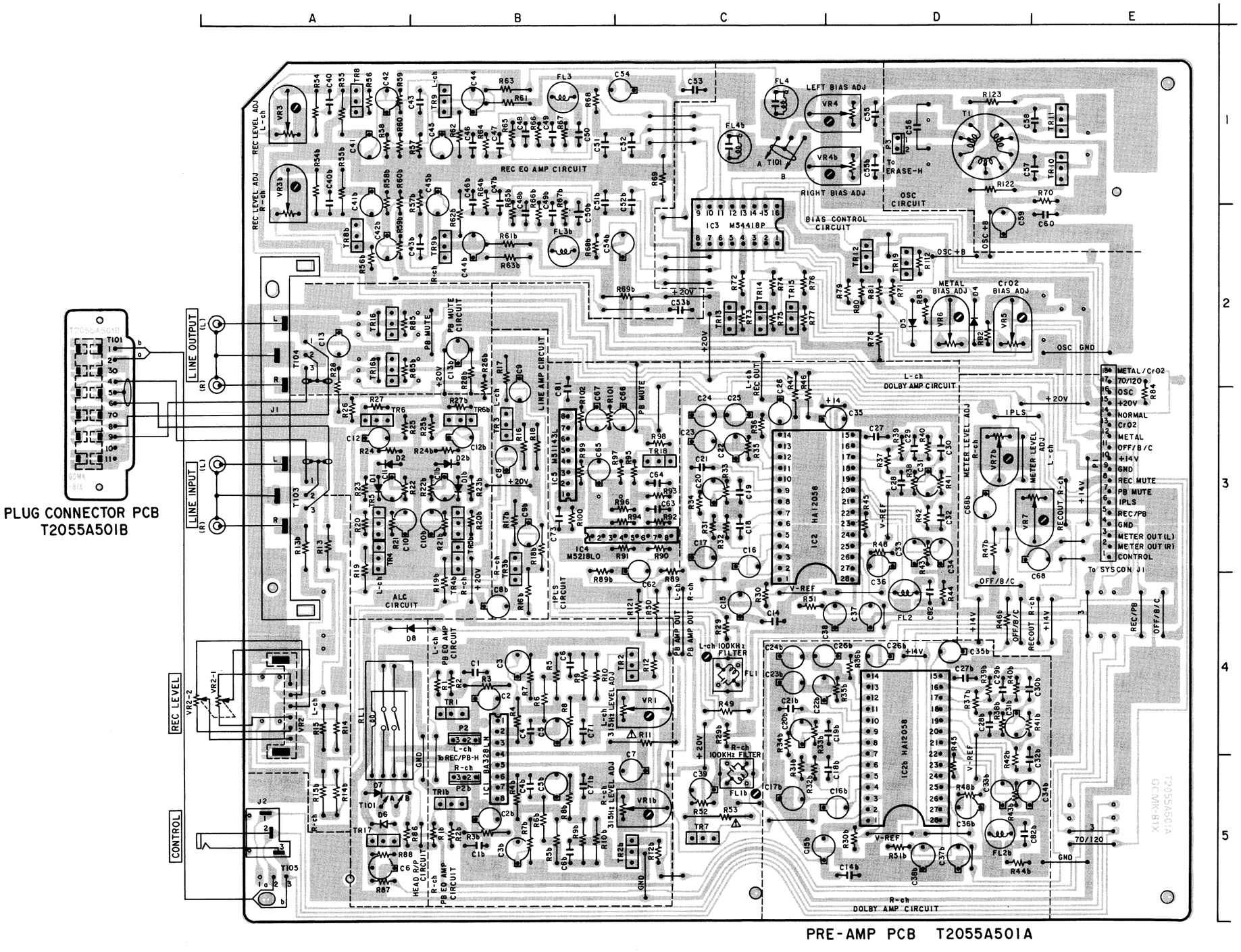
XI. CLASSIFICATION OF VARIOUS P.C BOARDS

11-1 P.C BOARD TITLES AND IDENTIFICATION NUMBERS

P.C Board Title		P.C Board Number
PRE AMP	P.C BOARD	T2055A501A
PLUG CONNECTOR	P.C BOARD	T2055A501B
METER	P.C BOARD	T2055A502A
SYSTEM CONTROL	P.C BOARD	T2055A502B
POWER	P.C BOARD	T2055B5030 [J]
POWER	P.C BOARD	T2055B5031 [C] [A]
POWER	P.C BOARD	T2055B5030 [U]
POWER	P.C BOARD	T2055B5032 [E] [B] [S]
CONTROL	P.C BOARD	CMR01C189A
LEAF SWITCH	P.C BOARD	CMR01C1490
FLEXIBLE	P.C BOARD	CMR01A0020
COM DIRECTION	P.C BOARD	CMR01C189B
CAM MOTOR PULSE	P.C BOARD	CMR01C189C
REEL ROTATION	P.C BOARD	CMR01D1440
DETECTOR (A)	P.C BOARD	CMR01D1290
DETECTOR (B)	P.C BOARD	CMR01D1620
GUIDE DETECTOR	P.C BOARD	CMR01D0220
HOUSING	P.C BOARD	CMR01D1430

11-2 COMPOSITION OF VARIOUS P.C BOARDS

1) PRE AMP P.C BOARD T2055A501A and PLUG CONNECTOR P.C BOARD T2055A501B



PLUG CONNECTOR PCB
T2055A501B

PRE-AMP PCB T2055A501A

TR1,13 to15,19---- 2SD1012-V(G,H)
TR2---------- 2SC2320(E,F,G)
TR3---------- 2SC2320L(F,G)
TR4---------- 2SC2603(G)
TR5---------- 2SC2603(F,G)
TR6,18---------- 2SC2603(E,F)
TR7---------- 2SD863(E,F)
TR8,16---------- 2SD1012-V(F,G)
TR9---------- 2SC2320(E,F)
TR10,11---------- 2SC2274K(E,F)
TR12---------- 2SD863
TR17---------- 2SC2603(G)

LOCATION OF TR'S

TR1---------B4	TR8--------A1
TR1b--------A5	TR8b-------A2
TR2---------C4	TR9--------B1
TR2b--------C5	TR9b-------B2
TR3,3b------B3	TR10,11-----E1
TR4---------A3	TR12------D2
TR4b--------B3	TR13 to15----C2
TR5---------A3	TR16,16b----A2
TR5b--------B3	TR17-------A5
TR6---------A3	TR18-------C3
TR6b--------B3	TR19------D2
TR7---------C5	

LOCATION OF IC'S

IC1---------B4
IC2---------C2
IC2b--------D4
IC3---------C2
IC4---------C3
IC5---------B3

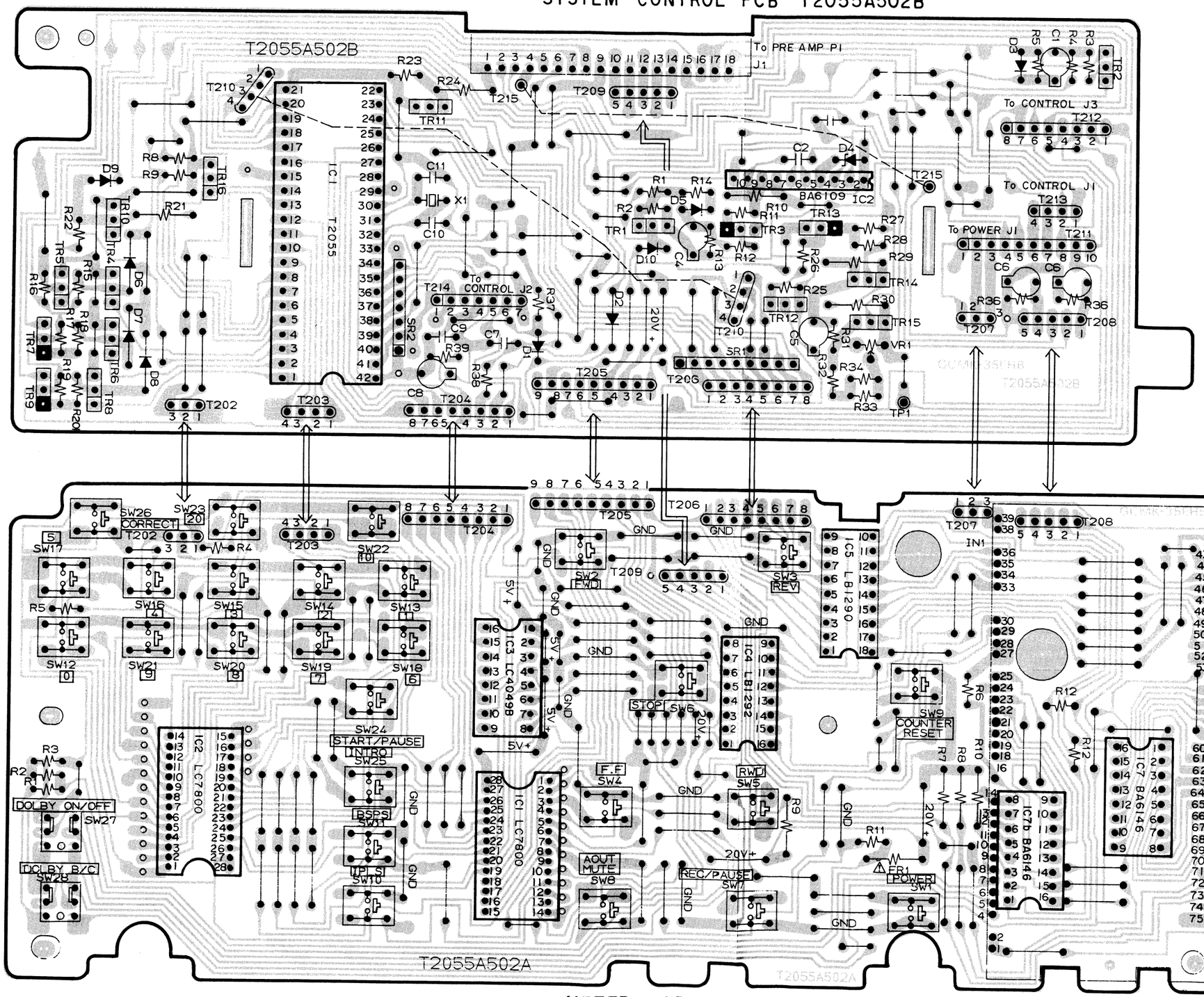
LOCATION OF CONNECTOR'S

P1----------E3
P2----------B4
P2b---------B5
P3----------D1
J1----------A3
J2----------A5

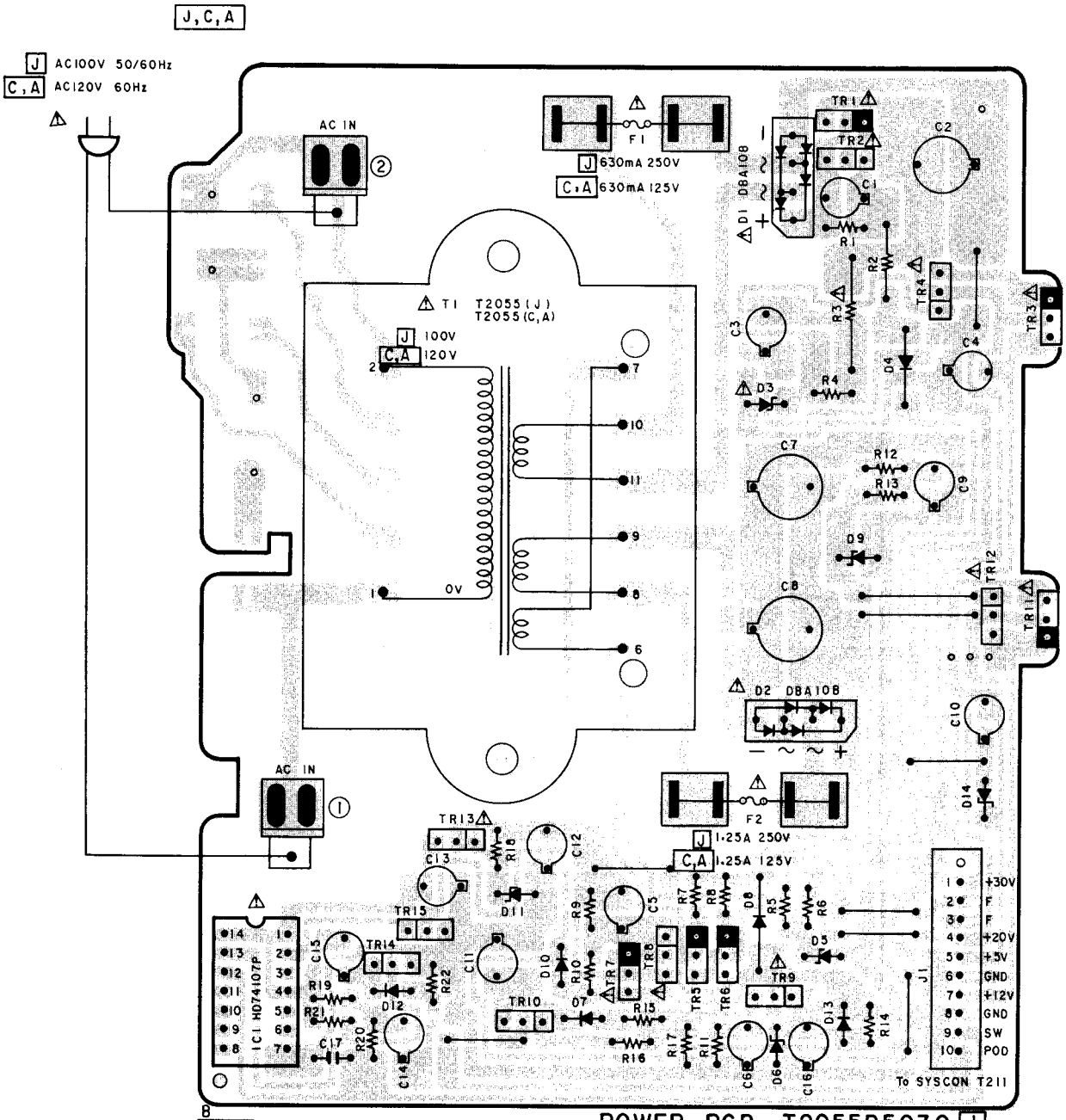
B
= PNP TRANSISTOR
= NPN TRANSISTOR
B

= SILICON DIODE
= GERMANIUM DIODE

2) METER P.C BOARD T2055A502A and SYSTEM CONTROL P.C BOARD T2055A502B



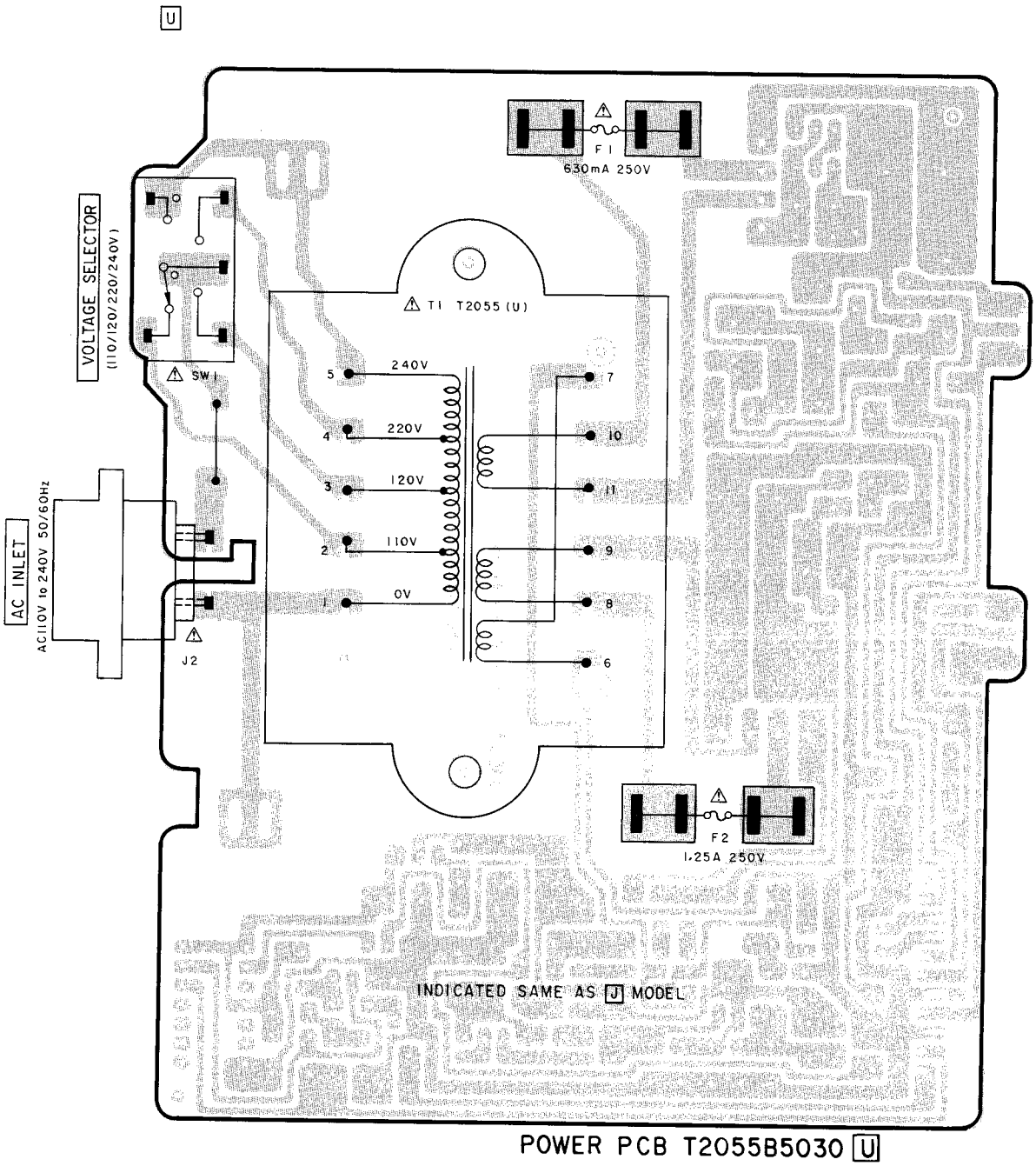
3) POWER P.C BOARD T2055B5030 [J], T2055B5031 [C] [A]



WARNING: ⚠INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

AVERTISSEMENT: ⚠IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDEES PAR LE FABRICANT

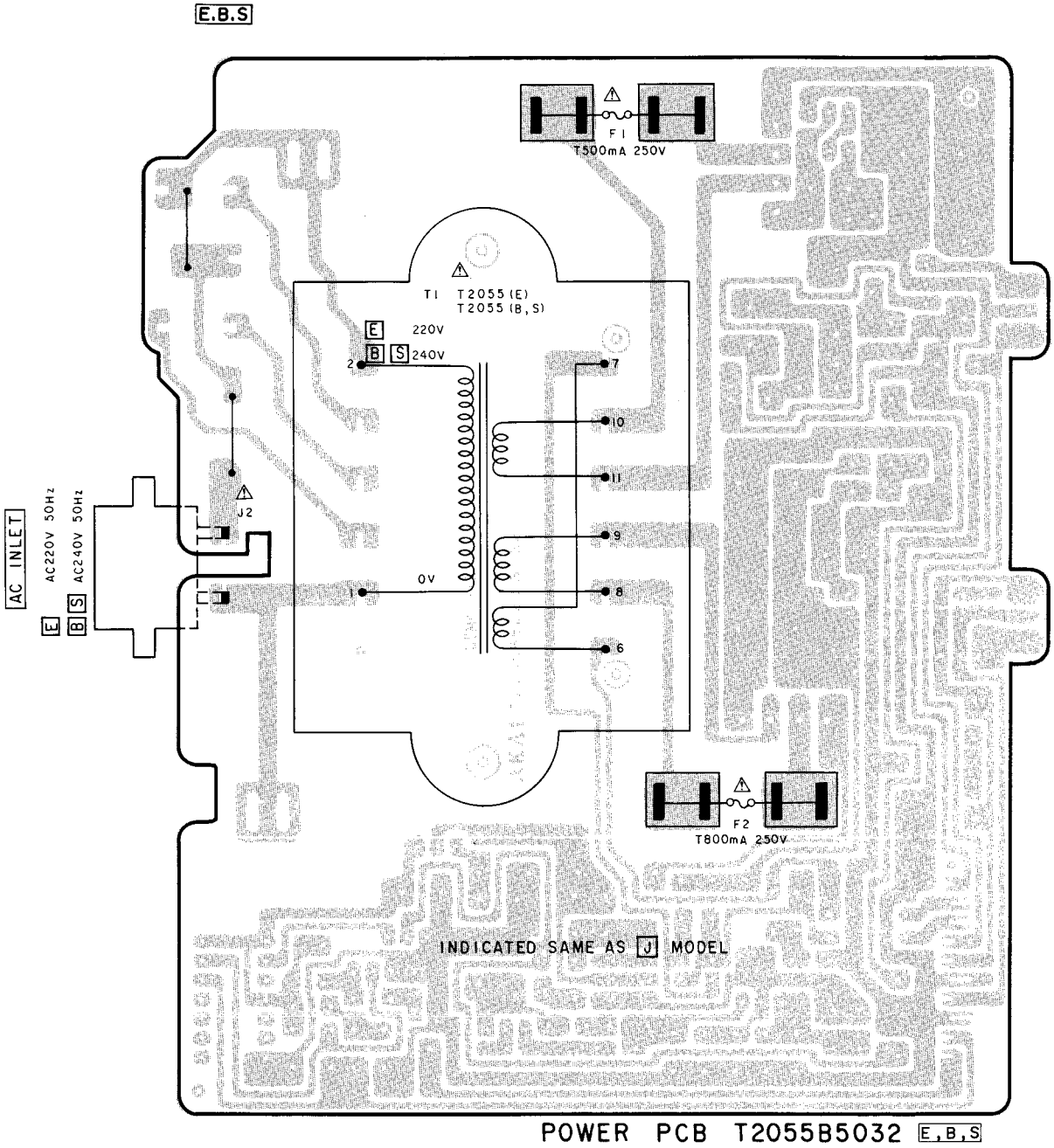
4) POWER P.C BOARD T2055B5030 [U]



WARNING: ⚠INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY. REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

AVERTISSEMENT: ⚠IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDEES PAR LE FABRICANT

5) POWER P.C BOARD T2055B5032 [E] [B] [S]



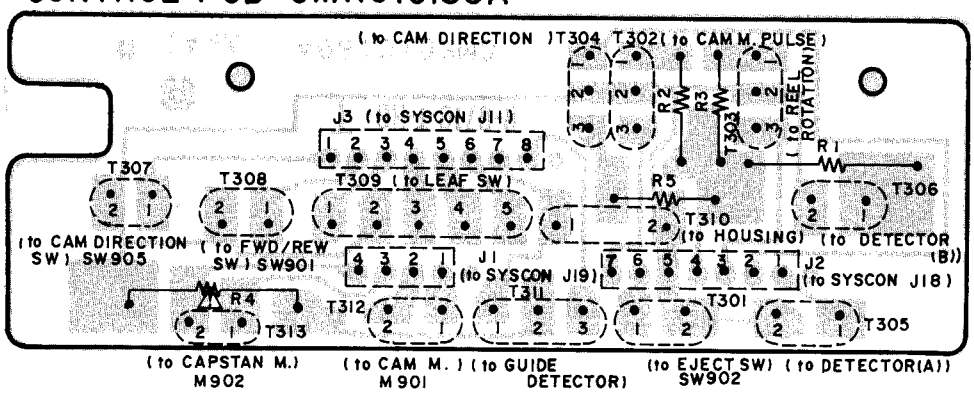
POWER PCB T2055B5032 E,B,S

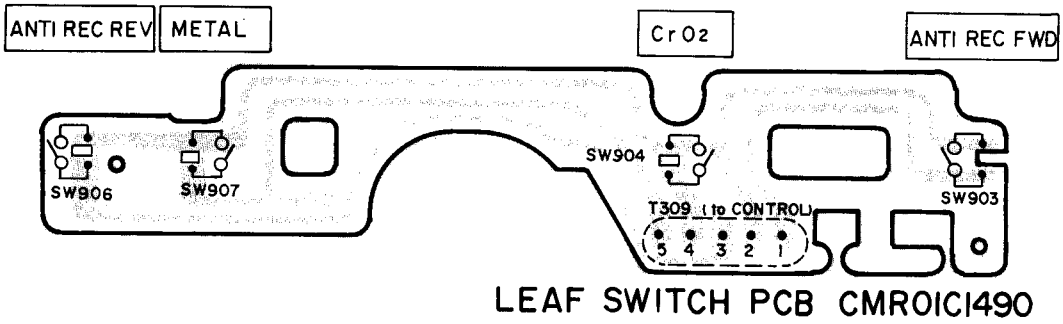
WARNING: ⚠INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

AVERTISSEMENT: ⚠IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDEES PAR LE FABRICANT

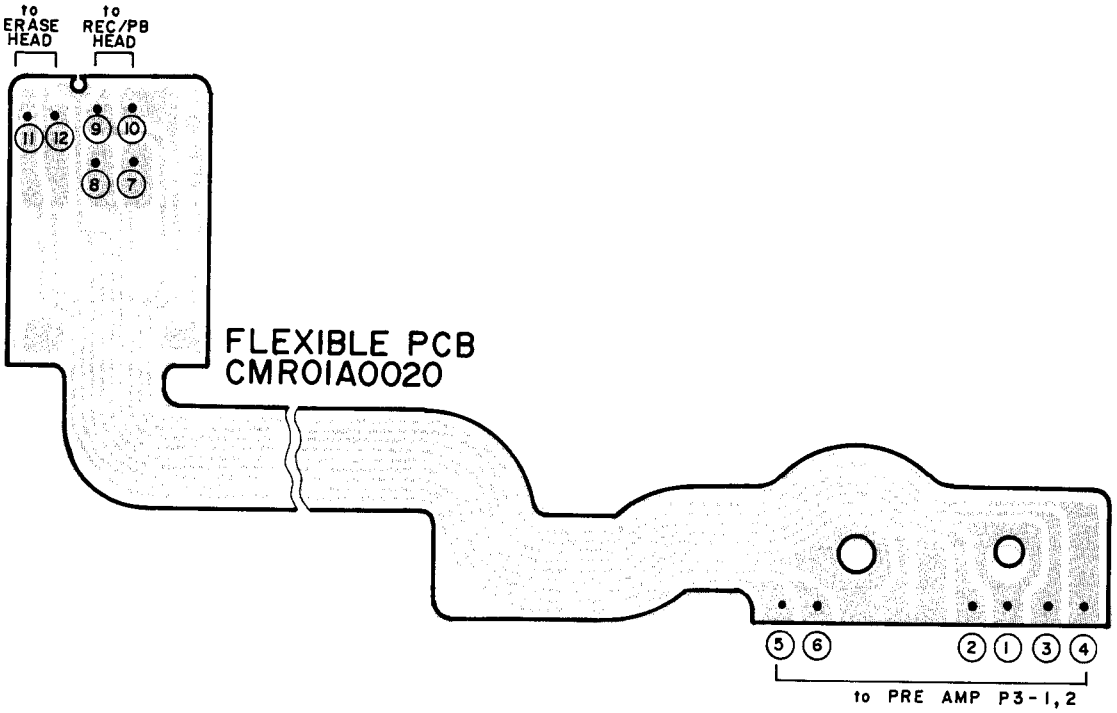
6) OTHER P.C BOARDS

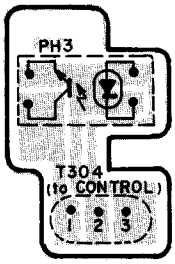
CONTROL PCB CMR01C189A



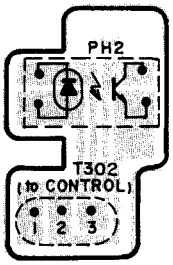


LEAF SWITCH PCB CMR01C1490

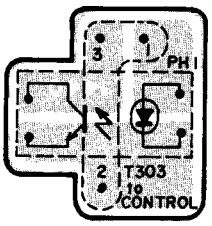




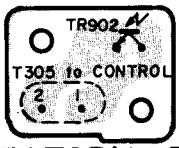
COM DIRECTION PCB CMR01C189B



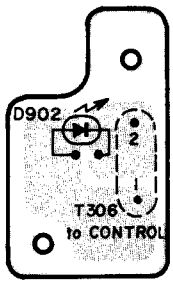
CAM MOTOR PULSE PCB CMR01C189C



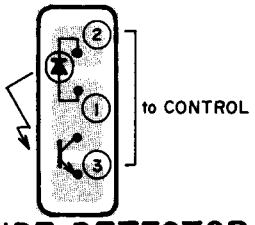
REEL ROTATION PCB CMR01D1440



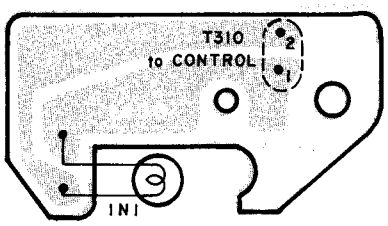
DETECTOR(A) PCB CMR01D1290



DETECTOR(B) PCB CMR01D1620



GUIDE DETECTOR PCB CMR01D0220



HOUSING PCB CMR01D1430

SECTION 2

PARTS LIST

TABLE OF CONTENTS

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1. MECHA CMR01 BLOCK 34
2. PRE AMP P.C BOARD BLOCK 36
3. SYSTEM CONTROL P.C BOARD BLOCK 36
4. POWER SUPPLY P.C BOARD BLOCK 37
5. ASSEMBLY BLOCK 38
6. FINAL ASSEMBLY BLOCK 39
INDEX 40

Resistors and Capacitors which are not listed in this parts list, please refer to COMMON LIST FOR SERVICE PARTS.

ATTENTION

1. When placing an order for parts, be sure to list the parts no. model no., and description. There are instances in which if any of this information is omitted, parts cannot be shipped or the wrong parts will be delivered.
2. Please be careful not to make a mistake in the parts no. If the parts no. is in error, a part different from the one ordered may be delivered.
3. Because parts number and parts unit supply in the Preliminary Parts List may be partially changed, please use this parts list for all future reference.

HOW TO USE THIS PARTS LIST

1. This Parts List shows the parts that are considered necessary for repairs. Other parts, such as resistors and capacitors, are shown in the "Common List for Service Parts". Select and order such parts from the "Common List for Service Parts".
2. The Recommended Spare Parts shows those parts in the Parts List which are considered particularly important for service.
3. Parts not shown in the Parts List and "Common List for Service Parts" will not be supplied in principle.
4. How to read list

a) Mechanism Block

2. HEAD BASE BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
2-1x	BH-T2023A320A	HEAD BASE BLOCK GX-F66R
2-2	HP-H2206A010A	HEAD R/P PR4-8FU C
2-3	ZS-477876	PAN20x03STL CMT
2-4	ZS-536488	BID20x08STL CMT
2-5	ZG-402895	CS ANGLE ADJUST SPRING

SP (Service Parts) Classification

A small "x" indicates the inability to show that particular part in the Photo or Illustration.

This number corresponds with the individual parts index number in that figure

This number corresponds with the Figure Number

b) P.C Board Block

6. SYS. CON. P.C BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
6-1	BA-T2034A070A	PC SYS CON BLK GX-F44R
6-IC1	EI-324536	IC HD14049BP
6-IC2	EI-336801	IC MB8841-564M
6-IC3	EI-331661	IC SN7405N
6-IC4	EI-336725	IC M54527P
6-TR1to4	ET-200985	TR 2SC2603 F,G
6-TR5to28	ET-554657	TR 2SA733A P,Q
6-D1	ED-318292	D SILICON H 1S2473T-77 T26
6-D2to4	ED-308952	D GERMA V 1K34A-LR F07
6-D5to10	ED-318292	D SILICON H 1S2473T-77 T26
6-X1	EI-318384	OSC X'TAL NC-18C 3.579545MHZ

SP (Service Parts) Classification

This reference numbers corresponds with symbol numbers of Schematic Diagrams.

5. Both the kind of part and installation position can be determined by the Parts Number. To determine where a parts number is listed, utilize Parts Index at end of Parts List. It is necessary first of all to find the Parts Number. This can be accomplished by using the Reference Number listed at right of parts number in the Parts Index.

WARNING

⚠ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.

AVERTISSEMENT

⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SURETE. POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL NE REMPLACER LES COMPOSANTS DONT LE FONCTIONNEMENT EST CRITIQUE POUR LA SECURITE QUE PAR DES PIECES RECOMMANDEES PAR LE FABRICANT.

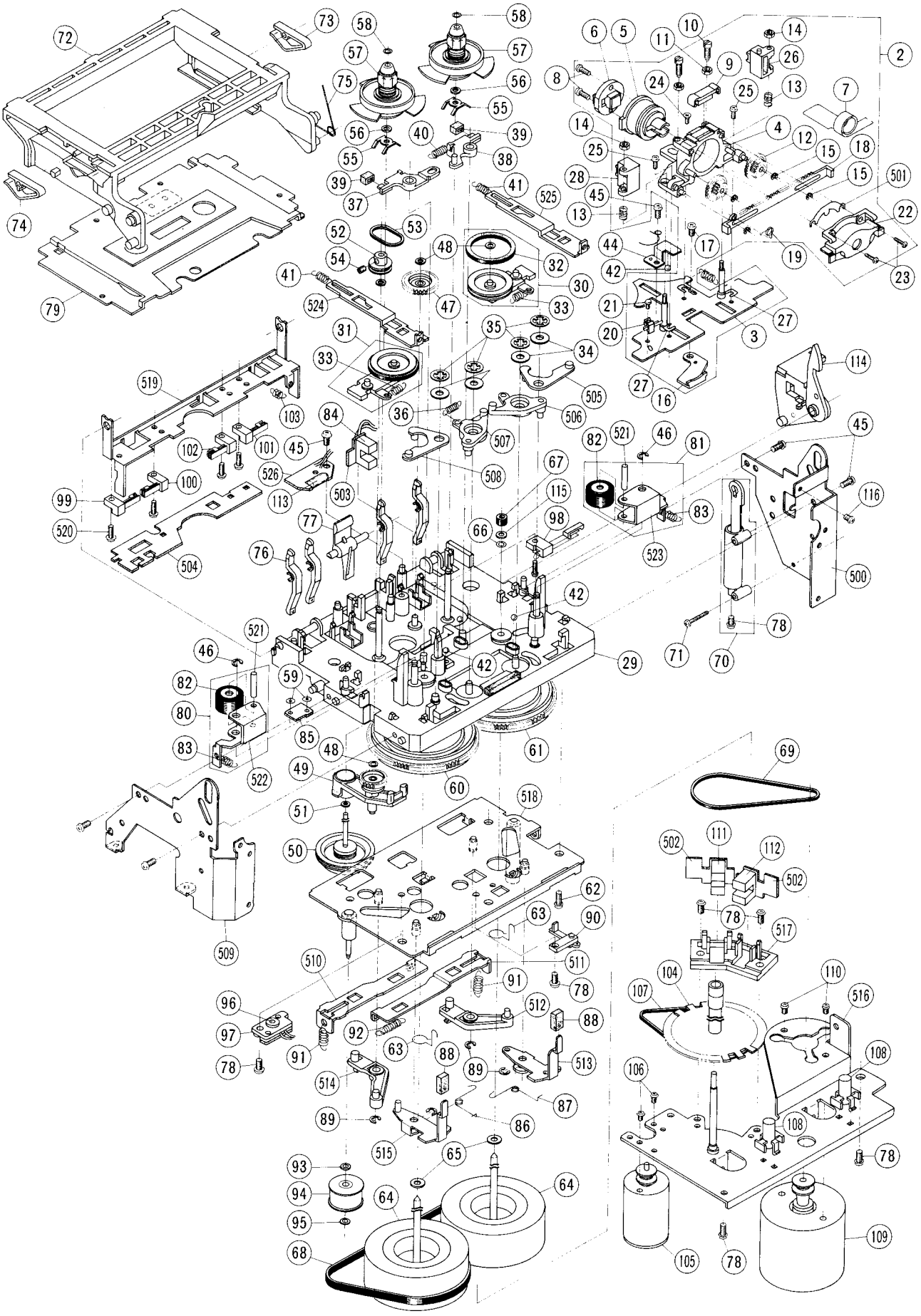
RECOMMENDED SPARE PARTS

Because, if the parts listed below are on hand, almost any repair can be accomplished, we suggest that you stock these Recommended Spare Parts Items.

NO.		PARTS NO.	DESCRIPTION
1		BF-344029	FLYWHEEL
2		BH-T2045A030A	HEAD BLK HX-R5
3		BL-T2045A050A	ARM PINCH ROLLER (L) BLK HX-R5
4		BL-T2045A060A	ARM PINCH ROLLER (R) BLK HX-R5
5		BM-B604491	MOTOR (PULLEY) PART EG-510ED 2B2
6		BM-B604490	MOTOR OPERATION (PULLEY) PART
7		BR-344098	REEL TABLE (A) ASSY
8	N	BT-349363	⚠ TRANS POWER T2055(A,C)
9	N	BT-349365	⚠ TRANS POWER T2055(B,S)
10	N	BT-349364	⚠ TRANS POWER T2055(E)
11	N	BT-349362	⚠ TRANS POWER T2055(J)
12	N	BT-349361	⚠ TRANS POWER T2055(U)
13		BZ-T2045A040A	GUIDE DETECTION BLK HX-R5
14		ED-330319	⚠ D SILICON DBA10B 100/1.0A
15	N	ED-308952	D GERMA V 1K34A-LR F07
16		ED-310340	D LED GL350 INFRARED RAY (D902)
17		ED-301911	D SILICON H DS448
18	N	ED-200469	D SILICON H DS448 FA5 F10
19		ED-344280	D SILICON H GMA-01-FY2 F05
20	N	ED-200468	D SILICON V DS448-VB6
21	N	ED-337868	D ZENER V HZ20-3S7
22	N	ED-343958	D ZENER V HZ5A-2S7
23	N	ED-337259	D ZENER V HZ6A-3S7
24	N	ED-337259	D ZENER V HZ6A-3S7
25	N	ED-337867	D ZENER V HZ6C-2S7
26	N	ED-338454	D ZENER V HZ9C-2S7
27		EF-593706	⚠ FUSE SEMKO T 250V 0.50A
28		EF-258344	⚠ FUSE SEMKO T 250V 0.80A
29		EF-306124	⚠ FUSE TSC A 250V 0.63A
30		EF-306949	⚠ FUSE TSC A 250V 1.25A
31		EF-305703	⚠ FUSE TSC 125V 0.63A
32		EF-309392	⚠ FUSE TSC 125V 1.25A
33	N	EH-349374	COMP R RKC1/8B8 4.7K J
34	N	EH-337695	FILTER DB 201AK-005 100KHZ
35		EI-322993	⚠ IC HD74107P
36	N	EI-349663	IC BA328LN
37		EI-330352	IC BA6109
38		EI-337845	IC BA6146 M
39		EI-349196	IC HA12058
40		EI-337013	IC LB1290
41		EI-345765	IC LB1292
42		EI-337009	IC LC4049B
43		EI-337008	IC LC7800
44		EI-337228	IC M5218L0
45		EI-337228	IC M5218L0
46	N	EI-349388	IC M54418P
47	N	EI-349369	IC T2055
48		EI-349372	OSC CE CSA4.00MG 4MHZ
49	N	EJ-349379	PHONE J 2P HSJ1011-630 3.5
50		EJ-347664	PIN J YKC21-5053 P 4P
51		EJ-351021	SOCKET CONNECTER M1688 12P
52		EL-348214	PL LEAD 28.0V 24MA (IN1)
53	N	EM-349368	IND FL BG-212Z DOUBLE
54		EO-347162	COIL FIX 1 L-8 103J
55	N	EO-351534	COIL FIX 1 RX9P 363J
56		EO-345760	COIL OSC 1 32-5009-12 100 KHZ
57		EO-315758	COIL TUN 1 100S-431 100.00KHZ
58		EO-337067	RELAY LEAD LAB2NS 2NO 18V
59	N	ER-328520	⚠ R FUSE ERD2FC 1/4W 1000G
60		ES-344104	SW LEAF BSW-191 01-1 NO(SW901)
61		ES-344101	SW LEAF MD-1003 01-1 NO(SW905)
62		ES-336814	SW LEAF MSW-1150NBK 01-1 NO (SW902)
63		ES-344253	SW LEAF MSW-1418J 01-1 NO (SW904)
64		ES-344257	SW LEAF MSW-1418L 01-1 NO (SW903)
65		ES-337843	SW PUSH ESB-64501 02-2
66	N	ES-349367	SW TACT KHH10906
67	N	ET-336941	⚠ TR 2SD313 E,F
68		ET-310148	⚠ TR 2SD612K E,F
69	N	ET-307349	⚠ TR 2SD794 P,Q
70		ET-344102	PHOTO SENSOR GP-1S04 (PH2)
71		ET-310341	PHOTO SENSOR PT350 T (TR902)
72		ET-311977	PHOTO SENSOR SPI-201 (PH1)
73	N	ET-200558	TR 2SA1115 E,F
74		ET-348931	TR 2SB774 R,S,T
75	N	ET-309353	TR 2SC2274K E,F
76		ET-328578	TR 2SC2320 E,F
77		ET-349705	TR 2SC2320 E,F,G
78		ET-344275	TR 2SC2320L F,G
79	N	ET-200505	TR 2SC2603 E,F
80	N	ET-200985	TR 2SC2603 F,G
81		ET-308141	TR 2SC2603 G
82		ET-349081	TR 2SC3383 S,T
83	N	ET-349366	TR 2SC3402
84	N	ET-328437	TR 2SD1012-V F,G
85	N	ET-328868	TR 2SD1012-V G,H
86	N	ET-328868	TR 2SD1012-V G,H
87	N	ET-318239	TR 2SD863 E,F
88	N	EV-315416	R S-FIX H D8 3P 103
89	N	EV-315414	R S-FIX H D8 3P 203
90		EV-322413	R S-FIX H D8 3P 302
91	N	EV-315413	R S-FIX H D8 3P 503
92		EV-336785	R S-FIX H TM8KV2-1S 3P 0.50W 104
93		EV-522652	R S-FIX V V8K1-1 3P 105
94	N	EV-349376	VR ROTARY 16P10×3J 3B503
95		HR-344103	HEAD COMBO HD425804RVJ
96		MB-344088	BELT CAM
97		MB-344041	BELT CAPSTAN
98		MB-344042	BELT WIND (A)
99		MB-344043	BELT WIND (B)
100		MB-344028	PULLEY RUBBER
101		MI-344095	IDLER PLAY(L) ASSY
102		MI-344094	IDLER PLAY(R) ASSY

"NOTE" N : New Parts

MECHA CMR01 BLOCK



1. MECHA CMR01 BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
1-1	BB-T2045A020C	MECHA CMR01 HX-M7R
1-2	BH-T2045A030A	HEAD BLK HX-R5
		HEAD BLOCK
1-3	MZ-B344008	CHASSIS HEAD PART
1-4	HZ-B344009	HOUSING ROTARY PART
1-5	HZ-B344006	HOLDER ROTARY PART
1-6	HR-344103	HEAD COMBO HD425804RVJ
1-7	EA-343156	PC HEAD FLEXIBLE CMR01A0020
1-8	ZS-245147	CTS20x06STL BNI
1-9	HZ-344011	GUIDE ROTARY HEAD
1-10	ZS-344001	SCREW AZIMUTH
1-11	ZW-273734	N20BRS NI3 1
1-12	MZ-344004	GEAR HEAD
1-13	ZG-344012	SP PUSH GUIDE TAPE
1-14	ZW-618884	N20STL CMT 1
1-15	ZW-391397	RING E120SUP CMT
1-16	MZ-344002	PLATE ADJUST
1-17	ZS-442585	BID26x04STL CMT
1-18	MZ-344007	RACK
1-19	ZG-344013	SP TORSION RACK
1-20	ES-344104	SW LEAF BSW-191 01-1 NO(SW901)
1-21	ZS-343125	BID14x03STL BNI
1-22	HZ-344015	COVER HOUSING
1-23	ZS-345773	BID17x06STL BNI
1-24	ZS-524812	CTS20x04STL CMT
1-25	ZS-608095	PAN20x05STL CMT
1-26	HZ-344093	GUIDE TAPE
1-27	ZW-344639A	SPACER ADJUST (A) 0.10MM
1-27	ZW-344639B	SPACER ADJUST (B) 0.15MM
1-27	ZW-344639C	SPACER ADJUST (C) 0.20MM
1-27	ZW-344639D	SPACER ADJUST (D) 0.25MM
1-27	ZW-344639E	SPACER ADJUST (E) 0.30MM
1-27	ZW-344639F	SPACER ADJUST (F) 0.35MM
1-27	ZW-344639G	SPACER ADJUST (G) 0.40MM
1-27	ZW-344639H	SPACER ADJUST (H) 0.45MM
1-27	ZW-344639J	SPACER ADJUST (I) 0.50MM
1-28	BZ-T2045A040A	GUIDE DETECTION BLK HX-R5
		MECHA CMR01 BLOCK
1-29	MZ-B344018	CHASSIS MECHA PART
1-30	MI-344094	IDLER PLAY (R) ASSY
1-31	MI-344095	IDLER PLAY (L) ASSY
1-32	MB-345139	WHEEL RUBBER
1-33	ZG-343195	SP PULL IDLER
1-34	ZW-268222	PW31x080x030STL CMT
1-35	ZW-329422	RING CS0300
1-36	ZG-312923	SP T1-3.2/0.2-11.2 T1-040
1-37	ML-344032	LEVER BRAKE (L)
1-38	ML-344033	LEVER BRAKE (R)
1-39	MB-344034	BRAKE RUBBER
1-40	ZG-312925	SP T1-3.2/0.2-14.0 T1-042
1-41	ZG-349016	SP PULL SLIDE
1-42	MV-666887	BALL 250STL
1-43	ZG-343193	SP PULL HEAD CHASSIS RETURN
1-44	MZ-344039	PLATE HEAD HOLD
1-45	ZS-336613	PT PAN26x06STL CMT
1-46	ZW-270088	RING E 190SUP CMT
1-47	MZ-344036	GEAR WIND (B)
1-48	ZW-343120	PW17x040x025PSL
1-49	ML-344096	ARM REWIND ASSY
1-50	TC-344097	WIND ASSY
1-51	ZW-305546	PW21x040x025PSL
1-52	MR-344037	PULLEY WIND
1-53	MB-344043	BELT WIND (B)
1-54	ZS-353047	–SET26x03STL CMT HP
1-55	ZG-344031	SP PLATE BT
1-56	ZW-381644	PW21x040x013PSL
1-57	BR-344098	REEL TABLE (A) ASSY
1-58	ZW-343120	PW17x040x025PSL
1-59	ZW-349046	WASHER FIXATION
1-60	MZ-344019	CAM WHEEL (L)
1-61	MZ-344020	CAM WHEEL (R)
1-62	ZS-336613	PT PAN26x06STL CMT
1-63	ZG-344064	SP PULL EARTH
1-64	BF-344029	FLYWHEEL
1-65	ZW-344047	SPACER FLYWHEEL
1-66	ZW-349047	WASHER OIL STOPPER
1-67	MB-344028	PULLEY RUBBER
1-68	MB-344041	BELT CAPSTAN
1-69	MB-344042	BELT WIND (A)
1-70	MZ-344099	DUMPER ASSY
1-71	ZS-343113	ST PAN20x12STL CMT
1-72	SP-344057	LID CASE
1-73	ZG-336615	SP PLATE CASSETTE HOLDER (B)
1-74	ZG-344939	SP PLATE CASSETTE HOLDER
1-75	ZG-344058A	SP TORSION LID (R)
1-76	ML-344286	LEVER DETECTION (A)
1-77	ML-344053	LEVER DETECTION (B)
1-78	ZS-321194	ST PAN26x05STL CMT
1-79	BD-B344049A1	LID DECORATION (A)-1 PART
1-80	BL-T2045A050A	ARM PINCH ROLLER (L) BLK HX-R5
1-81	BL-T2045A060A	ATM PINCH ROLLER (R) BLK HX-R5
1-82	MP-336153	PINCH ROLLER (A)
1-83	ZG-344089	SP PULL PINCH ROLLER
1-84	ET-311977	PHOTO SENSOR SPI-201
1-85	ET-310341	PHOTO SENSOR PT350 T
1-86	ZG-345660	SP TORTION RETURN (L)
1-87	ZG-345661	SP TORTION RETURN (R)
1-88	MB-349019	RUBBER ARM RETURN
1-89	ZW-270088	RING 190SUP CMT
1-90	ES-344101	SW LEAF MD-1003 01-1 NO(SW905)
1-91	ZG-344090	SP PULL DRIVE ARM
1-92	ZG-312945	SP T1-3.2/0.29-14.0 T1-061
1-93	ZW-305546	PW21x040x025PSL
1-94	MR-B344076	PULLEY MIDDLE PART
1-95	ZW-343120	PW17x040x025PSL
1-96	ED-310340	D LED GL350 INFRARED RAY (D902)
1-97	TC-344062	HOLDER STOP SENSOR
1-98	ES-336814	SW LEAF MSW-1150NBK 01-1 NO (SW902)
1-99	ES-344257	SW LEAF MSW-1418L 01-1 NO (SW903)
1-100	ES-344253	SW LEAF MSW-1418J 01-1 NO (SW904)
1-101	ES-344257	SW LEAF MSW-1418L 01-1 NO (SW906)
1-102	ES-344253	SW LEAF MSW-1418J 01-1 NO (SW907)
1-103	ZG-344091	SP PULL HOLDER
1-104	MR-344080	PULLEY CAM SLIT
1-105	BM-B604490	MOTOR OPERATION (PULLEY) PART
1-106	ZS-477876	PAN20x03STL CMT
1-107	MB-344088	BELT CAM
1-108	MZ-344083	HOLDER THRUST
1-109	BM-B604491	MOTOR (PULLEY) PART EG-510ED 2B2
1-110	ZS-592378	PAN26x03STL CMT
1-111	ET-344102	PHOTO SENSOR GP-1S04 (PH2)
1-112	ET-344102	PHOTO SENSOR GP-1S04 (PH3)
1-113	EL-348214	PL LEAD 28.0V 24MA (IN1)
1-114	ML-344055	ARM LOCK (R)
1-115	SZ-349017	FELT CAPSTAN
1-116	ZS-201475	PAN20x03STL NI3
		CONTROL P.C BOARD
1-117x	ER-333698	⚠ R CB H S15 FS RDS 1/2W 821J (R4)

NOTE: Parts listed in 1 to 117 on the exploded view and parts list are normaly stocked for replacement purpose.
The remaining parts shown in this manual are not normaly stocked, because they are not seldom required for routine service.

2. PRE AMP P.C BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
2-1	BA-T2055A020A	PC PRE AMP BLK HX-M77R
2-IC1	EI-349663	IC BA328LN
2-IC2	EI-349196	IC HA12058
2-IC3	EI-349388	IC M54418P
2-IC4	EI-337228	IC M5218L0
2-IC5	EI-348701	IC M51143L
2-TR1	ET-328868	TR 2SD1012-V G,H
2-TR2	ET-349705	TR 2SC2320 E,F,G
2-TR3	ET-344275	TR 2SC2320L F,G
2-TR4	ET-308141	TR 2SC2603 G
2-TR5	ET-200985	TR 2SC2603 F,G
2-TR6	ET-200505	TR 2SC2603 E,F
2-TR7	ET-318239	⚠ TR 2SD863 E,F
2-TR8	ET-328437	TR 2SD1012-V F,G
2-TR9	ET-328578	TR 2SC2320 E,F
2-TR10,11	ET-309353	TR 2SC2274K E,F
2-TR12	ET-318239	TR 2SD863 E,F
2-TR13to15	ET-328868	TR 2SD1012-V G,H
2-TR16	ET-328437	TR 2SD1012-V F,G
2-TR17	ET-308141	TR 2SC2603 G
2-TR18	ET-200505	TR 2SC2603 E,F
2-TR19	ET-328868	TR 2SD1012-V G,H
2-D1,2	ED-344280	D SILICON H GMA-01-FY2 F05
2-D4,5	ED-301911	D SILICON H DS448
2-D6	ED-308952	D GERMA V 1K34A-LR F07
2-D7,8	ED-301911	D SILICON H DS448
2-VR1	EV-315413	R S-FIX H D8 3P 503
2-VR2	EV-349376	VR ROTARY 16P10×3J 3B503
2-VR3	EV-315414	R S-FIX H D8 3P 203
2-VR4	EV-336785	R S-FIX H TM8KV2-1S 3P 0.50W 104
2-VR5	EV-315416	R S-FIX H D8 3P 103
2-VR6	EV-322413	R S-FIX H D8 3P 302
2-VR7	EV-315413	R S-FIX H D8 3P 503
2-RL1	EQ-337067	RELAY LEAD LAB2NS 2NO 18V
2-T1	EO-345760	COIL OSC 1 32-5009-12 100 KHZ
2-FL1	EH-337695	FILTER DB 201AK-005 100 KHZ
2-FL2	EO-351534	COIL FIX 1 RX9P 363J
2-FL3	EO-347162	COIL FIX 1 L-8 103J
2-FL4	EO-315758	COIL TUN 1 100S-431 100.0KHZ
2-R11	ER-333598	⚠ R CB H S15 FS RDS 1/2W 102J
2-R53	ER-333617	⚠ R CB H S15 FS RDS 1/2W 152J
2-C1	EC-310440	C STY V F05 CQF09 471J 50DC
2-C55	EC-347247	C MC V F05 FM 101J 500DC
2-C56	EC-345817	C PP V F10 APH 272J 630DC
2-J1	EJ-347664	PIN J YKC21-5053 P 4P
2-J2	EJ-349379	PHONE J 2P HSJ1011-630 3.5

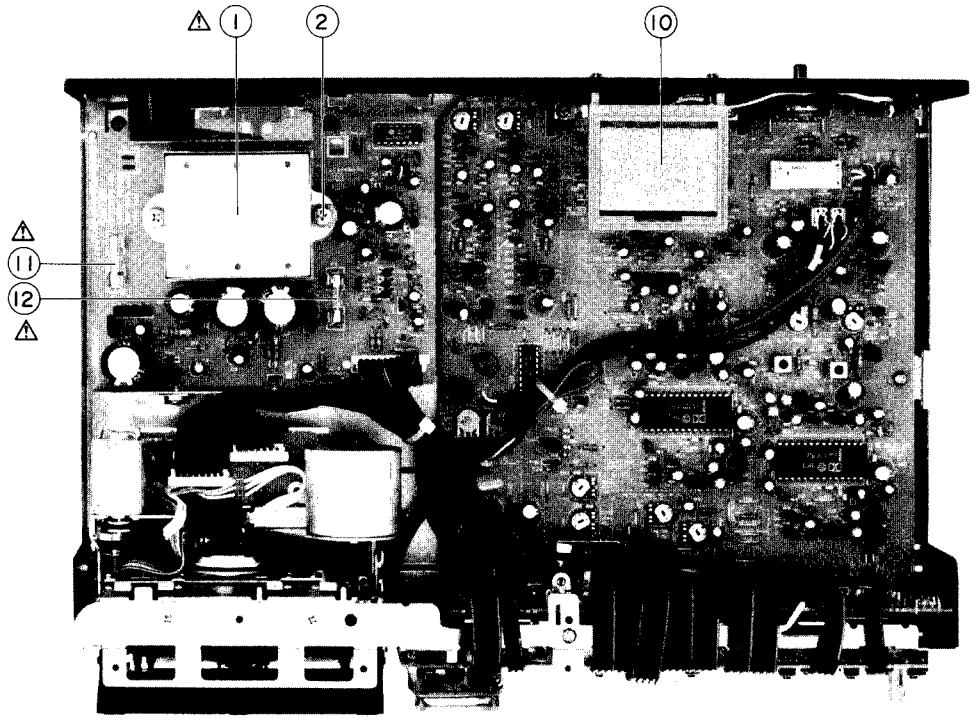
3. SYSTEM CONTROL P.C BOARD BLOCK

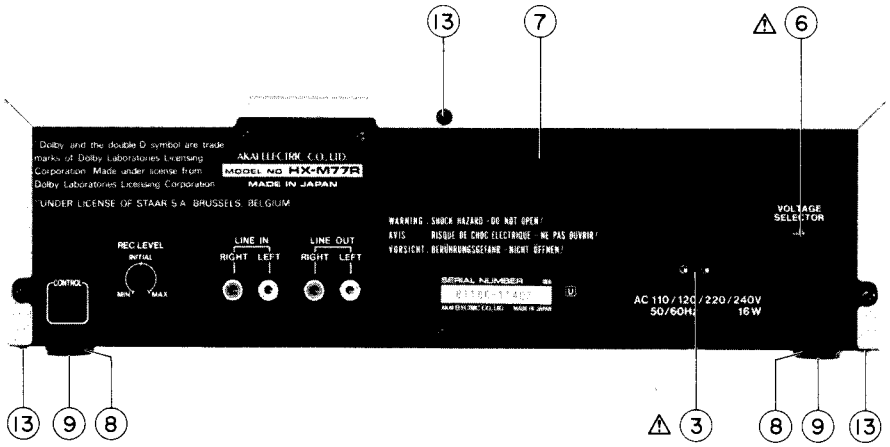
REF. NO.	PARTS NO.	DESCRIPTION
3-1	BA-T2055A050A	PC SYSCON BLK HX-M77R
		METER P.C BOARD
3-IC1A,2A	EI-337008	IC LC7800
3-IC3A	EI-337009	IC LC4049B
3-IC4A	EI-345765	IC LB1292
3-IC5A	EI-337013	IC LB1290
3-IC7A	EI-337845	IC BA6146 M
3-SW1Ato26A	ES-349367	SW TACT KHH10906
3-SW27A,28A	ES-337843	SW PUSH ESB-64501 02-2
3-FR1A	ER-328520	⚠ R FUSE ERD2FC 1/4W 1000G
3-IN1A	EM-349368	IND FL BG-212Z DOUBLE
		SYSTEM CONTROL P.C BOARD
3-IC1B	EI-349369	IC T2055
3-IC2B	EI-330352	IC BA6109
3-TR1B	ET-200505	TR 2SC2603 E,F
3-TR2B	ET-349366	TR 2SC3402
3-TR3B	ET-200558	TR 2SA1115 E,F
3-TR4Bto6B	ET-349366	TR 2SC3402
3-TR7B	ET-348931	TR 2SB774 R,S,T
3-TR8B	ET-349366	TR 2SC3402
3-TR9B	ET-200558	TR 2SA1115 E,F
3-TR10Bto12B	ET-200505	TR 2SC2603 E,F
3-TR13B	ET-200558	TR 2SA1115 E,F
3-TR14B,15B	ET-200505	TR 2SC2603 E,F
3-TR16B	ET-349366	TR 2SC3402
3-D1B	ED-344280	D SILICON H GMA-01-FY2 F05
3-D2B	ED-301911	D SILICON H DS448
3-D3B	ED-344280	D SILICON H GMA-01-FY2 F05
3-D4B	ED-338454	D ZENER V HZ9C-2S7
3-D5B	ED-344280	D SILICON H GMA-01-FY2 F05
3-D6Bto8B	ED-301911	D SILICON H DS448
3-D9B,10B	ED-344280	D SILICON H GMA-01-FY2 F05
3-VR1B	EV-522652	R S-FIX V V8K1-1 3P 105
3-SR1B	EH-349374	COMP R RKC1/8B8 4.7K J
3-SR2B	EH-349375	COMP R M3806
3-X1B	EI-349372	OSC CE CSA4.00MG 4MHZ

4. POWER SUPPLY P.C BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
4-1U	BA-T2055A040A	PC POWER BLK HX-M77R(U)
4-1J	BA-T2055A040B	PC POWER BLK HX-M77R(J)
4-1C	BA-T2055A040C	PC POWER BLK HX-M77R(C,A)
4-1E	BA-T2055A040D	PC POWER BLK HX-M77R (E,B,S)
		POWER SUPPLY P.C BOARD
4-IC1	EI-322993	IC HD74107P
4-TR1	ET-307349	⚠ TR 2SD794 P,Q
4-TR2	ET-200558	⚠ TR 2SA1115 E,F
4-TR4	ET-200505	⚠ TR 2SC2603 E,F
4-TR5,6	ET-328437	⚠ TR 2SD1012-V F,G
4-TR7	ET-307349	⚠ TR 2SD794 P,Q
4-TR8	ET-200558	⚠ TR 2SA1115 E,F
4-TR9	ET-200505	TR 2SC2603 E,F
4-TR10	ET-200558	TR 2SA1115 E,F
4-TR12	ET-200505	TR 2SC2603 E,F
4-TR13	ET-349081	⚠ TR 2SC3383 S,T
4-TR14,15	ET-349366	TR 2SC3402
4-D1,2	ED-330319	⚠ D SILICON DBA10B 100/1.0A
4-D3	ED-337868	⚠ D ZENER V HZ20-3S7
4-D4	ED-200469	D SILICON H DS448 FA5 F10
4-D5	ED-343958	D ZENER V HZ5A-2S7
4-D6	ED-337259	⚠ D ZENER V HZ6A-3S7
4-D7	ED-200468	D SILICON V DS448-VB6
4-D8	ED-323979	D SILICON W03B F12 100/1.0A
4-D9	ED-337867	⚠ D ZENER V HZ6C-2S7
4-D10	ED-200468	D SILICON V DS448-VB6
4-D11	ED-337259	D ZENER V HZ6A-3S7
4-D12,13	ED-200468	D SILICON V DS448-VB6
4-D14	ED-337867	D ZENER V HZ6C-2S7
4-R3	ER-337778	R OMF H S15 FS 1W 122J
4-C7,8	EC-350931	C EC V CUT SE 472M 16.0DC
4-C11	EC-350929	C EC V CUT SE 222M 6.3DC
		ASSEMBLY BLOCK
4-TR3	ET-336941	⚠ TR 2SD313 E,F
4-TR11	ET-310148	⚠ TR 2SD612K E,F

ASSEMBLY BLOCK

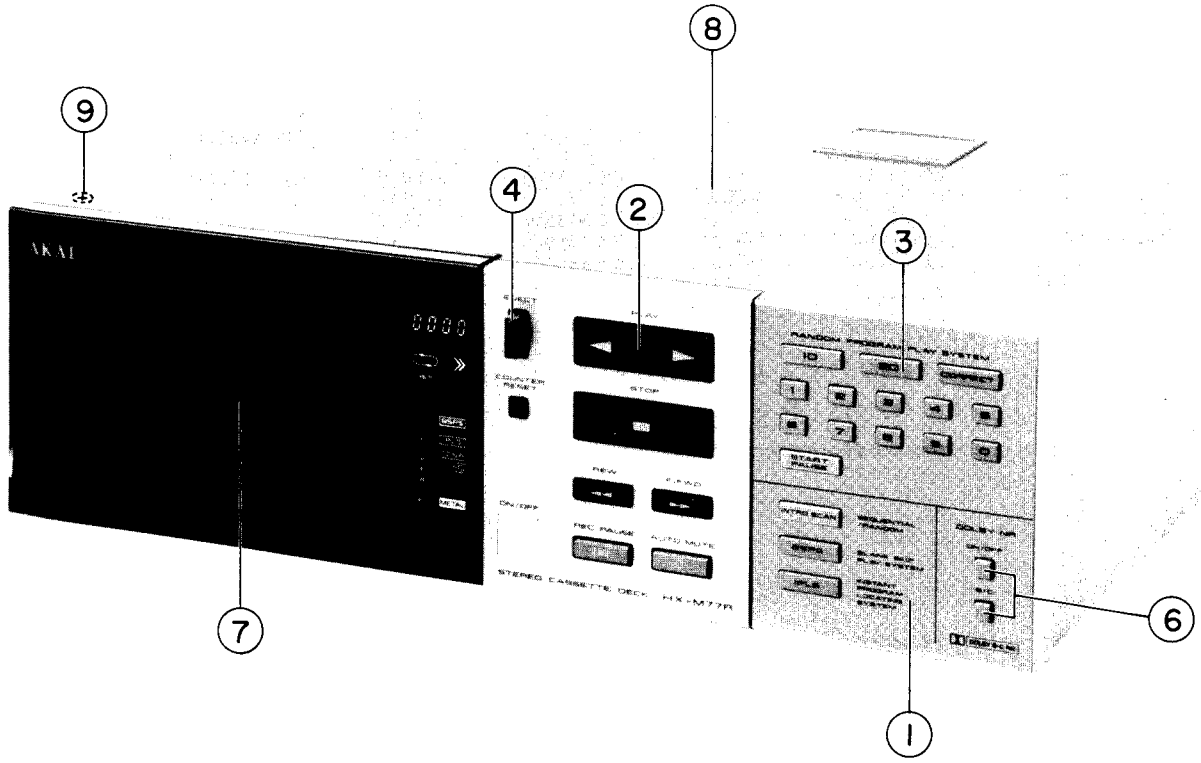




5. ASSEMBLY BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
5-1U	BT-349361	⚠ TRANS POWER T2055(U) (T1)
5-1J	BT-349362	⚠ TRANS POWER T2055(J) (T1)
5-1C	BT-349363	⚠ TRANS POWER T2055(A,C) (T1)
5-1E	BT-349364	⚠ TRANS POWER T2055(E) (T1)
5-1B	BT-349365	⚠ TRANS POWER T2055(B,S) (T1)
5-2	ZS-312116	ST BID40×20STL CMT
5-3	EJ-310567	⚠ SOCKET INLET 0378PC-GS E 2P (J2)(U,E,B,S)
5-4xU	EW-349359	⚠ AC CORD 2 CORES KP224/KS15 DK-7 U/T (U)
5-4xJ	EW-352124	⚠ AC CORD 2 CORES KP-224, HVFF DK7J (J)
5-4xC	EW-328245	⚠ AC CORD 2 CORES KP-8/STP-1 105C UC (C,A)
5-5x	EZ-631945	STRAIN RELIEF SR-4N-4 (J,C,A)
5-6	ES-344274	⚠ SW SELECTOR HXW0244-01-060 01-4 (U)
5-7U	SP-349338A	PANEL REAR HX-M77R (U)
5-7J	SP-349338B	PANEL REAR HX-M77R (J)
5-7C	SP-349338C	PANEL REAR HX-M77R (C,A)
5-7E	SP-349338D	PANEL REAR HX-M77R (E)
5-7B	SP-349338E	PANEL REAR HX-M77R (B,S)
5-8	SA-349332	FOOT
5-9	ZS-331567	T2BR30×08STL CMT C080
5-10	EJ-351021	SOCKET CONNECTER M1688 12P
5-11U	EF-306124	⚠ FUSE TSC A 250V 0.63A(U,J)(F1)
5-11C	EF-305703	⚠ FUSE TSC 125V 0.63A(C,A)(F1)
5-11E	EF-593706	⚠ FUSE SEMKO T 250V 0.50A (E,B,S)(F1)
5-12U	EF-306949	⚠ FUSE TSC A 250V 1.25A(U,J)(F2)
5-12C	EF-309392	⚠ FUSE TSC 125V 1.25A(C,A)(F2)
5-12E	EF-258344	⚠ FUSE SEMKO T 250V 0.80A (E,B,S)(F2)
5-13	ZS-447761	T2BR30×06STL BNI
5-14x	ZW-305013	RV POP32 (C,A)

FINAL ASSEMBLY BLOCK



6. FINAL ASSEMBLY BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
6-1U	BD-T2055A060A	PANEL FRONT BLK HX-M77R (U,J,E,B,S)
6-1C	BD-T2055A060B	PANEL FRONT BLK HX-M77R(C,A)
6-2	SK-349328B	KNOB OPERATE (A)-UL
6-3	SK-349329B	KNOB OPERATE (B)-UL
6-4	SK-349326	KNOB EJECT
6-5x	ZG-349502	SP PUSH EJECT
6-6	SK-349330	KNOB PUSH
6-7	SP-B349335	LID PART
6-8	SP-349334	COVER UPPER
6-9	ZS-342209	ST CTS30×06STL BNI

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BA-T2055A040A	4-1U
BA-T2055A040B	4-1J
BA-T2055A040C	4-1C
BA-T2055A040D	4-1E
BA-T2055A050A	3-1
BB-T2045A020C	1-1
BD-B344049A1	1-79
BD-T2055A060A	6-1U
BD-T2055A060B	6-1C
BF-344029	1-64
BH-T2045A030A	1-2
BL-T2045A050A	1-80
BL-T2045A060A	1-81
BM-B604490	1-105
BM-B604491	1-109
BR-344098	1-57
BT-349361	5-1U
BT-349362	5-1J
BT-349363	5-1C
BT-349364	5-1E
BT-349365	5-1B
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EA-343156	1-7
EC-310440	2-C1
EC-345817	2-C56
EC-347247	2-C55
EC-350929	4-C11
EC-350931	4-C8
EC-350931	4-C7
ED-200468	4-D7
ED-200468	4-D12
ED-200468	4-D13
ED-200468	4-D10
ED-200469	4-D4
ED-301911	2-D4,5
ED-301911	2-D8
ED-301911	2-D7
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ED-301911	3-D8B
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EV-315414	2-VR3
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AKAI

MODEL HX-M77R

SECTION 3

SCHEMATIC DIAGRAM

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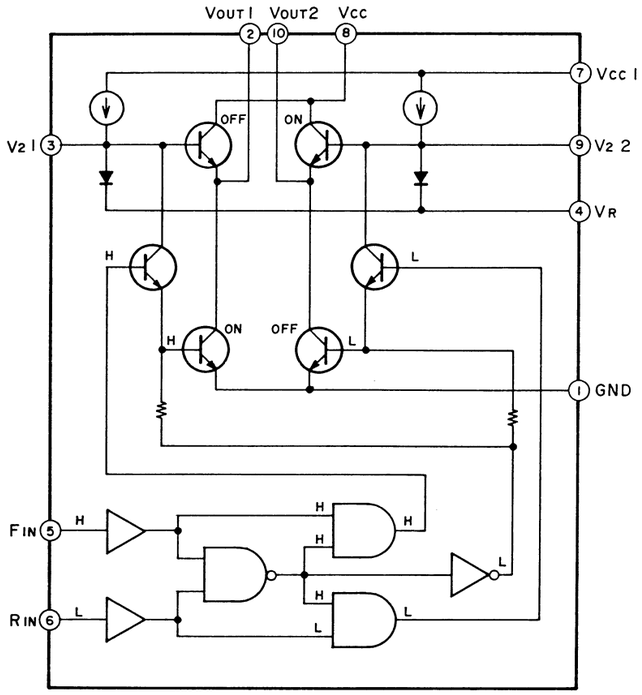
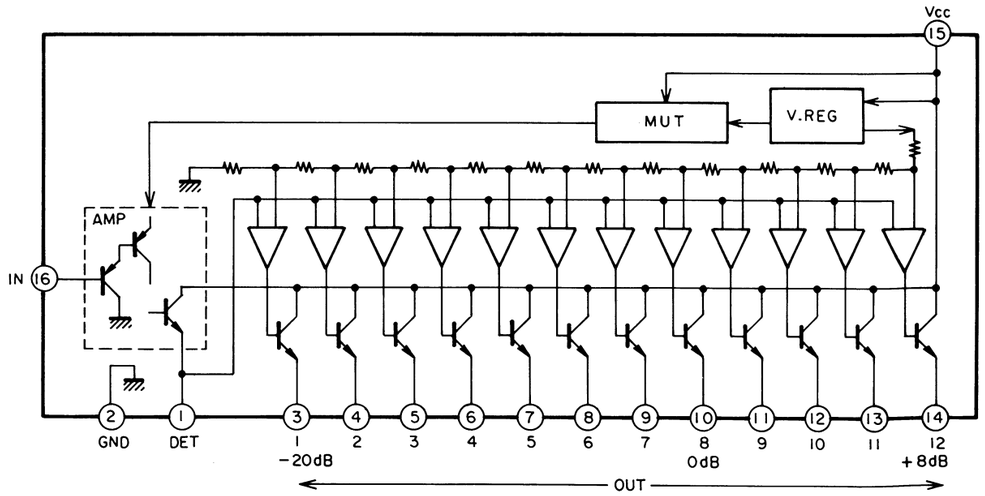
BA6109

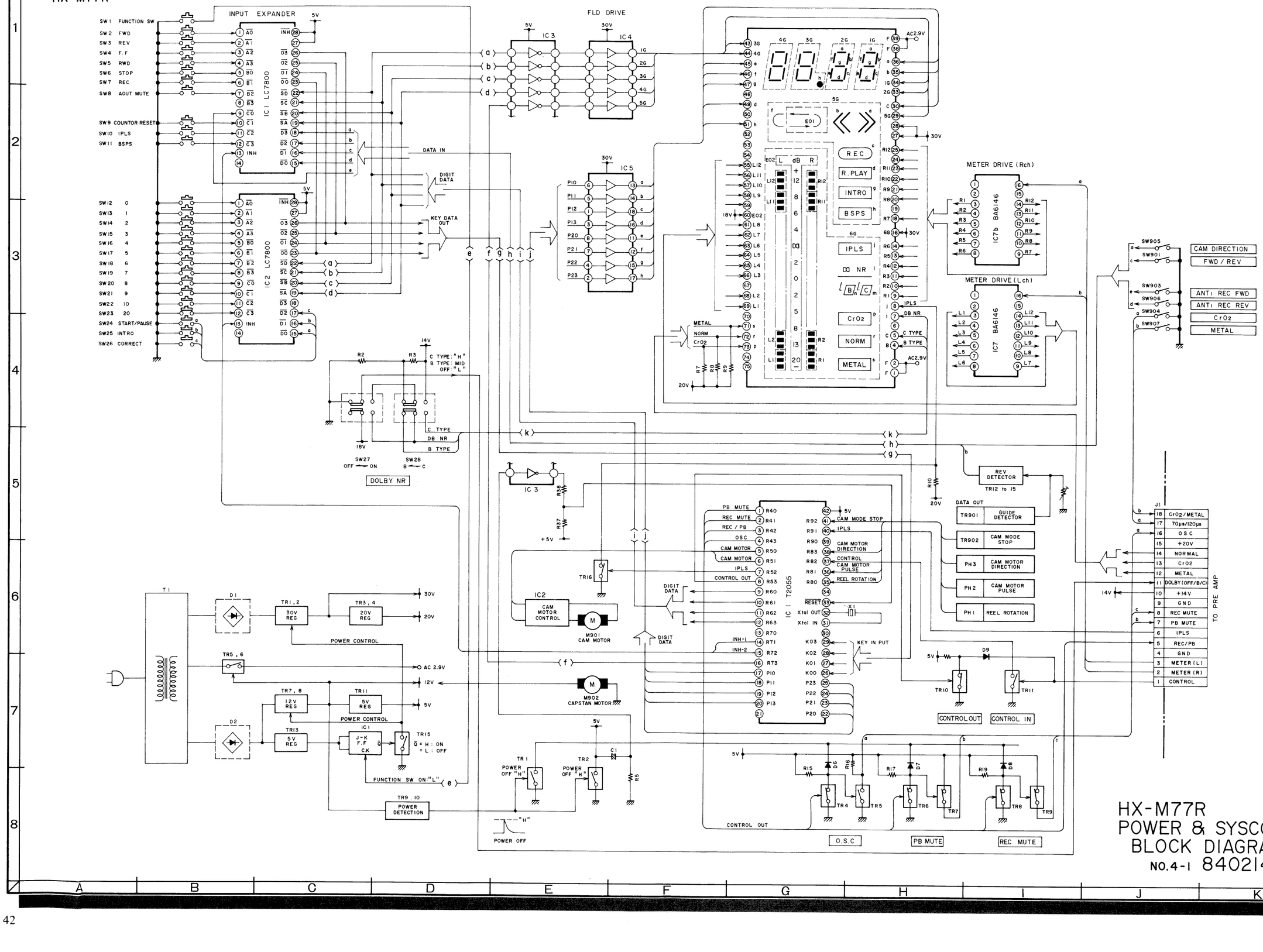


5	6	2	10
FIN	RIN	VOUT1	VOUT2
H	H	L	L
L	H	L	H
H	L	H	L
L	L	L	L

BA6146



HX-M77R



HX-M77R
POWER & SYSCON BLOCK DIAGRAM
NO.4-1 840214A

HX-M77R

FUNCTION SW
FWD
REV
FF
RWD
STOP
REC
AOUT MUTE

COUNTER RESET
IPLS
BSPS

0
1
2
3
4
5
6
7
8
9
10
20

START/PAUSE
INTRO
CORRECT

IC1 LC7800
IC2 LC7800
IC3 LC4049B
IC4 LB1292
IC5 LB1290

SW27 DOLBY NR OFF ⇄ ON
SW28 DOLBY B/C B ⇄ C

T202 T203 T204 T205 T206

INH2 INH1 5V
R63 R62 R61 R60
K00 K01 K02 K03 R73
RESET OUT RESET IN GND
CAM DERECTION GUIDE DETECTOR FWD/REV SW ANTI REV SW ANTI FWD SW EJECT SW 20V FUNCTION SW IPLS
P20 P21 P10 P11 P22 P13 P23 P12
NORMAL Cr02

SR1 4.7k X 8

T1 T2055(J,C,A)
D1 DBA10B
D2 DBA10B
D4 DS448
D5 HZ5A-2
D6 HZ6A-3
D7 DS448-VB6
D8 W03B
D10 DS448-VB6
D11 HZ6A-3
D12 DS448-VB6
D13 DS448-VB6
D3 HZ20-3
D8 HZ6C-2
D9 HZ6C-2
D14 HZ6C-2

TR1 2SD794(P,Q)
TR2 2SA1115(E,F)
TR3 2SD313(E,F)
TR4 2SC2603(E,F)
TR5,6 2SD1012-V (F,G)
TR7 2SD794(P,Q)
TR8 2SA1115(E,F)
TR9 2SC2603(E,F)
TR10 2SA1115(E,F)
TR11 2SD612K(E,F)
TR12 2SC2603 (E,F)
TR13 2SC3383(S,T)
TR14 2SC3402
TR15 2SC3402
TR16 2SC3402

J.C.A
J AC100V 50/60Hz
C,A AC120V 60Hz

J1
1 30V
2 AC2.9V
3 AC2.9V
4 20V
5 5V
6 MOTER GND
7 12V
8 GND
9 FUNCTION ON
10 FUNCTION OFF

※	U, J	C, A	E, B, S
F1	630mA250V	630mA125V	T500mA250V
F2	1.25A250V	1.25A125V	T800mA250V

VOLTAEG SELECTOR
SW1 240V 220V 120V 110V 0V
J2 U
TI 2055(U)
AC INLET
AC 110V to 240V
50/60Hz

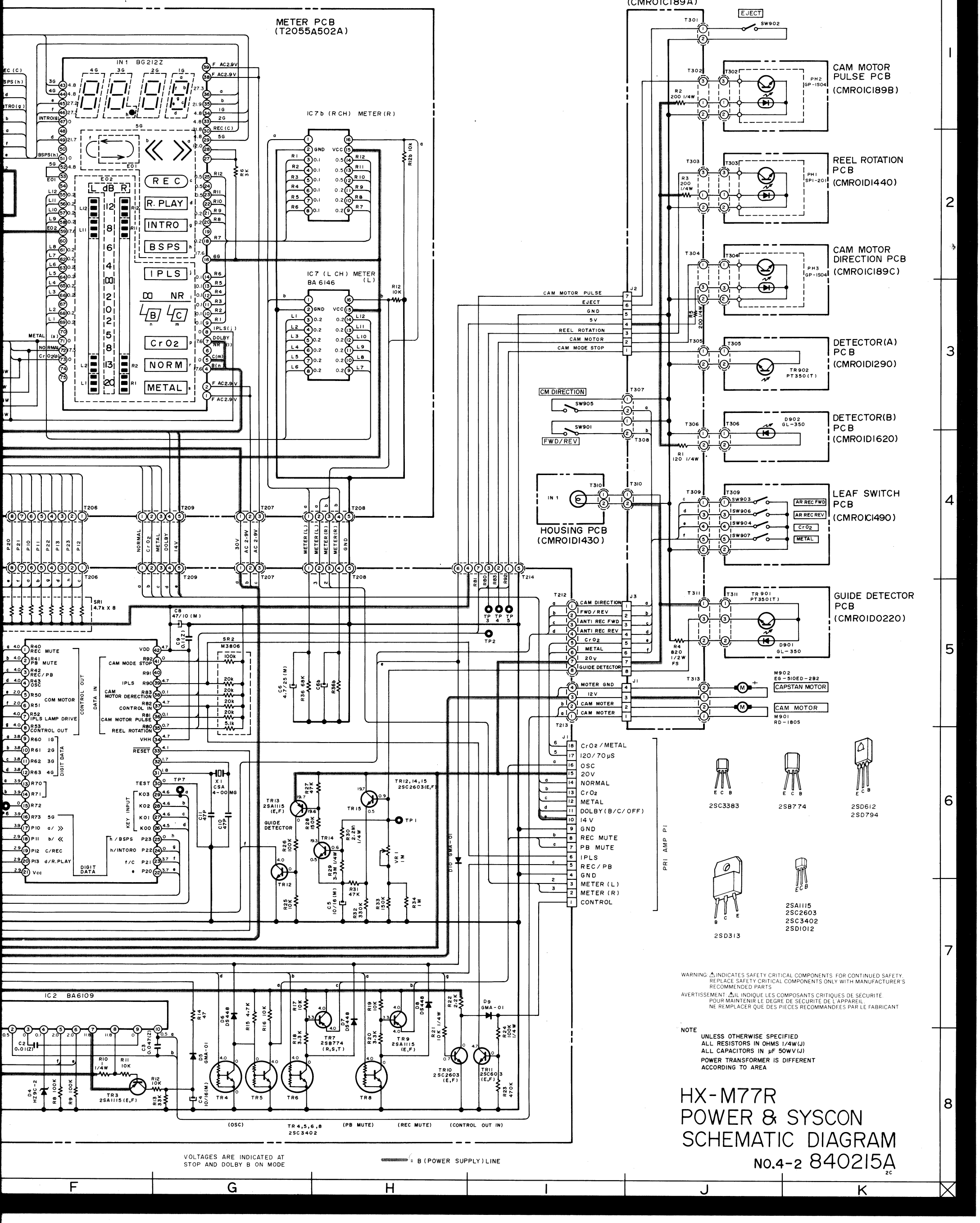
E. B.S
J2
E. AC220V 50Hz
B,S AC240V 50Hz
TI 2055 (E, B,S)

POWER SUPPLY PCB
U J : T2055B5030
C A : T2055B5031
E B S : T2055B5032

IC1 HD74107P
IC2 BA6109

TR1 2SC2603 (E,F)
TR2 2SC3402
D1 GMA-01
D2 DS448
D3 GMA-01
D4 HZ9C-2

SYSTEM CONTROL PCB
(T2055A502B)



VOLTAGES ARE INDICATED AT
STOP AND DOLBY B ON MODE

= B (POWER SUPPLY) LINE

WARNING: ⚠ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

AVERTISSEMENT: ⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SECURITE. POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL, NE REMPLACER QUE DES PIECES RECOMMANDEES PAR LE FABRICANT

NOTE

UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/4W(J)
ALL CAPACITORS IN μF 50WV(J)
POWER TRANSFORMER IS DIFFERENT ACCORDING TO AREA

HX-M77R
POWER & SYSCON SCHEMATIC DIAGRAM

NO.4-2 840215A
2C

HX-M77R

PB/REC HEAD

IC1 BA328LN

LINE AMP

VR1 PB LEVEL

TR1 PB : L → OFF REC : H → ON

TR2 70/120μS (A) 120μS : L → OFF 70μS : H → ON

S1a S1b S3a NR type S3b

OUT NR S2a IN

IC2 HA12058

Vref

S1 S2,3

R45

H : C TYPE
MID : B TYPE
L : DOLBY

PB : L / REC : H

LINE IN

LINE OUT

R19 R14 C8 R15

TR3 EF

FL1 BIAS FILTER

TR4,5,6 ALC

VR3 REC LEVEL

TR9 REC AMP

FL4 BIAS TRAP

TR8 (C) REC MUTE PB : H → ON REC : L → OFF

REC EQ METAL CrO2 PEAKING

IC3 M54418P

OUTPUT DRIVE

OUTPUT DRIVE

DECODER

20V RL1

TR17 (D) REC/PB PB : H → ON REC : L → OFF

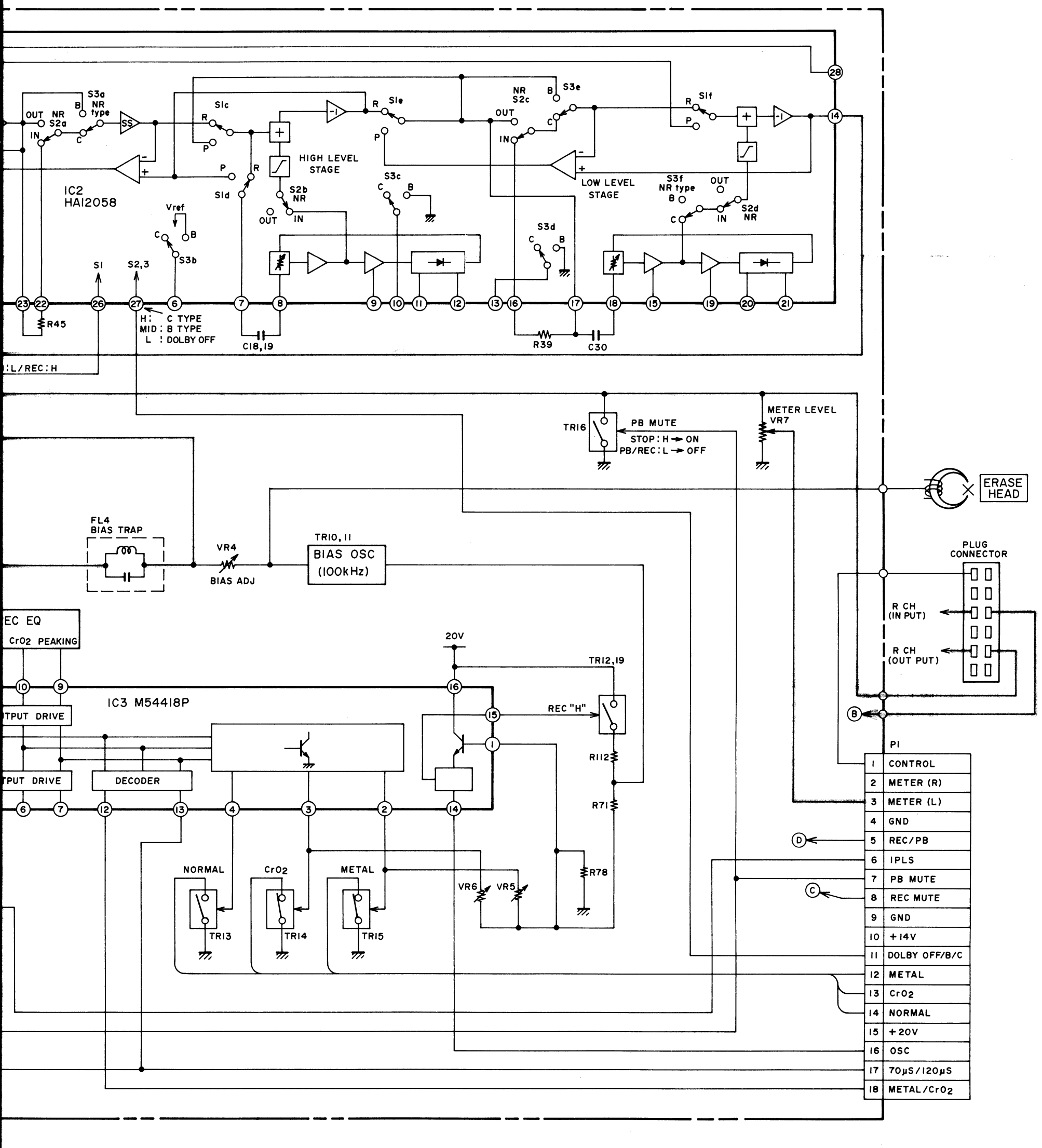
IC4 M5218LO OP AMP

IC5 M51143L IPLS AMP

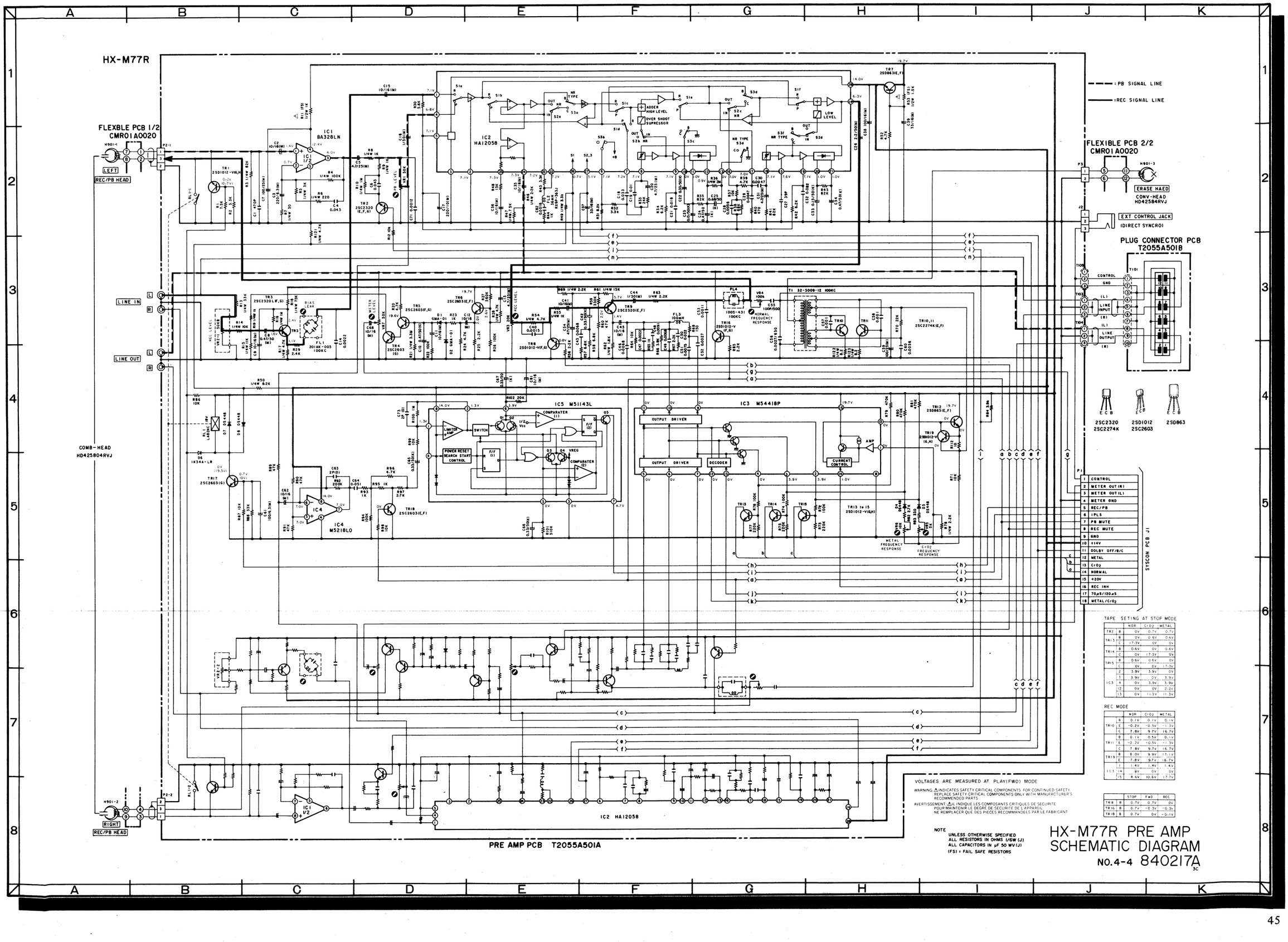
TR18 PB MUTE STOP : H → ON PB/REC : L → OFF

= PB SIGNAL MODE

= REC SIGNAL MODE



HX-M77R
PRE AMP
BLOCK DIAGRAM
NO.4-3 840216A



TAPE SETING AT STOP MODE

		NOR	CrO2	METAL
TR2	B	0V	0.7V	0.7V
TR13	B	0V	0.6V	0.6V
	C	17.3V	0V	0V
TR14	B	0.6V	0V	0.6V
	C	0V	17.3V	0V
TR15	B	0.6V	0.6V	0V
	C	0V	0V	17.3V
IC3	2	3.9V	3.9V	0V
	3	3.9V	0V	3.9V
	4	0V	3.9V	3.9V
	12	0V	0V	2.2V
	13	0V	11.3V	11.3V

REC MODE

		NOR	CrO2	METAL
TR10	B	0.1V	0.1V	0.1V
	E	-0.2V	-0.5V	-1.3V
	C	7.8V	9.7V	16.7V
TR11	B	0.1V	0.5V	0.1V
	E	-0.2V	-0.5V	-1.3V
	C	7.8V	9.7V	16.7V
TR19	B	8.0V	9.9V	17.1V
	E	7.8V	9.7V	16.7V
IC3	1	1.4V	1.4V	1.4V
	14	0V	0V	0V
	15	8.6V	10.6V	17.7V

	STOP	FWD	REC
TR8 B	0.7V	0.7V	0V
TR16 B	0.7V	-0.3V	-0.3V
TR18 B	0.7V	0V	-0.1V

VOLTAGES ARE MEASURED AT PLAY(FWD) MODE

WARNING ⚠ INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY. REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.

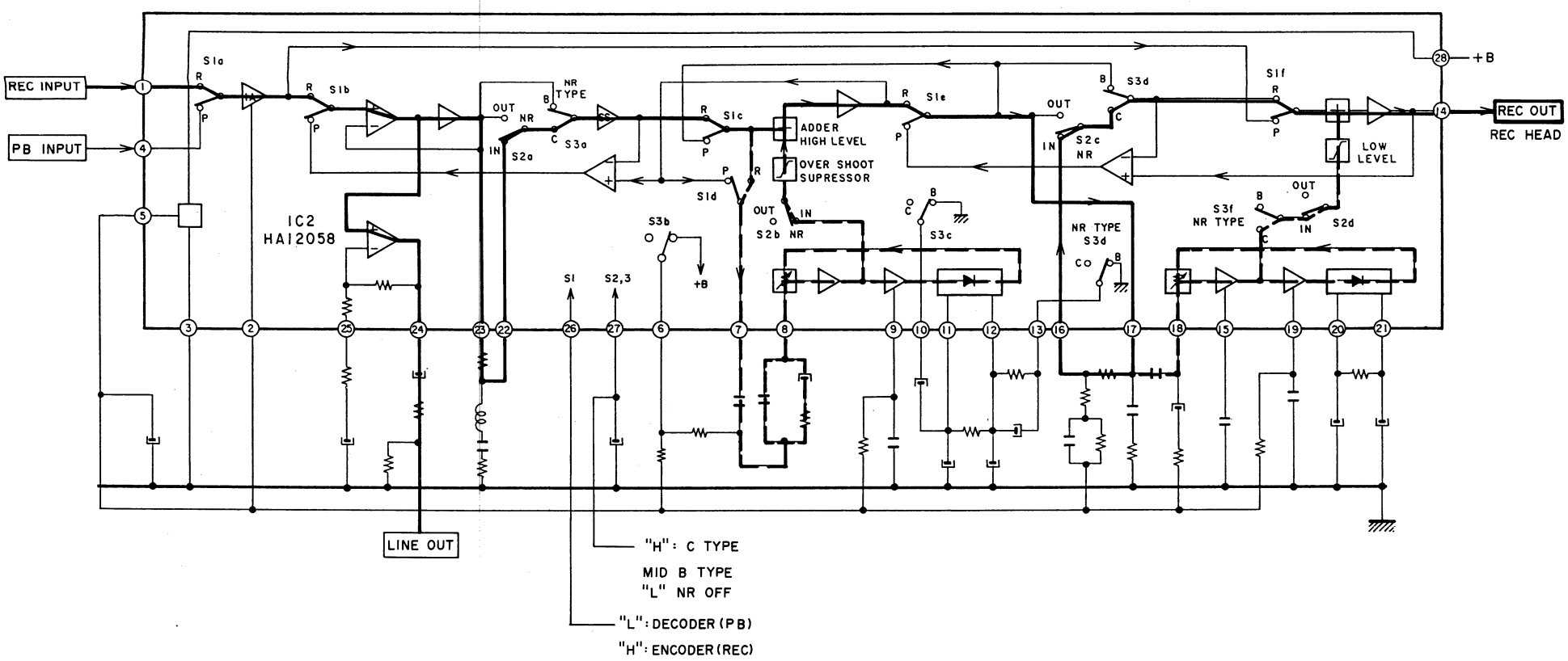
AVERTISSEMENT: ⚠ INDIQUE LES COMPOSANTS CRITIQUES DE SECURITE POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL. NE REMPLACER QUE DES PIECES RECOMMANDEES PAR LE FABRICANT

NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS (1/6W (J)
ALL CAPACITORS IN μF 50 WV (J)
(FS) = FAIL SAFE RESISTORS

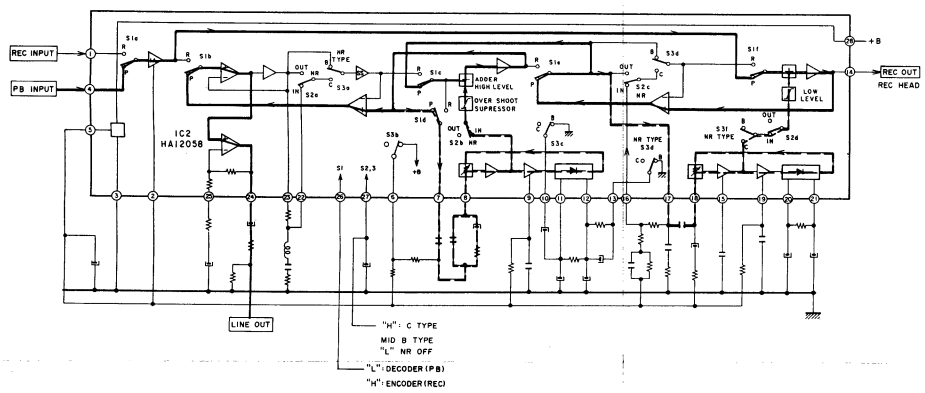
HX-M77R PRE AMP SCHEMATIC DIAGRAM

NO.4-4 840217A 3C

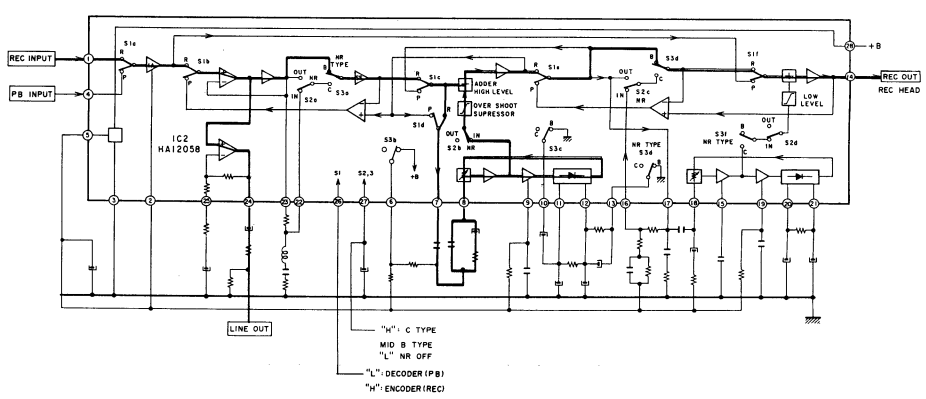
DOLBY C "ON" REC MODE



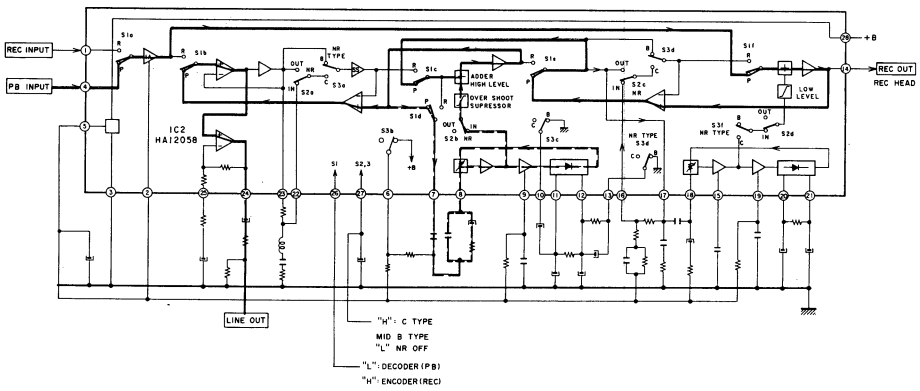
DOLBY C P.B MODE



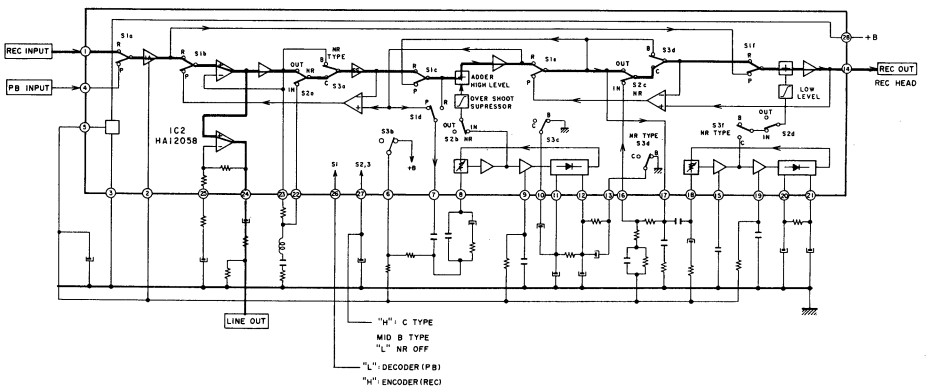
DOLBY B REC MODE



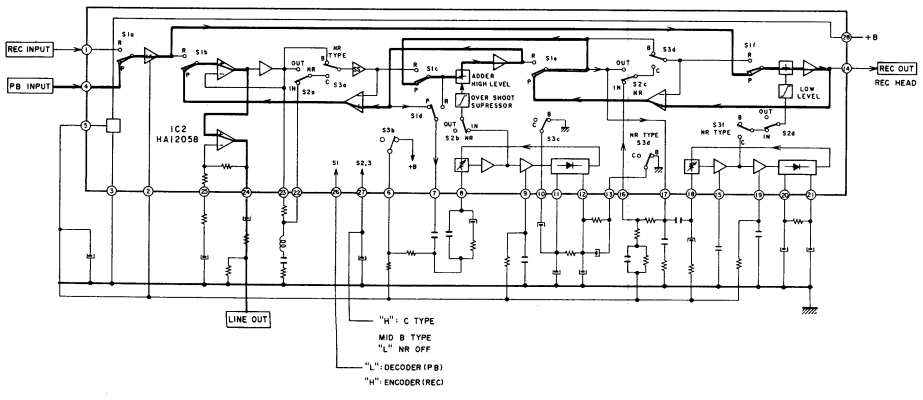
DOLBY B P.B MODE



DOLBY "OFF" REC MODE



DOLBY "OFF" P.B MODE



DOLBY IC (HA12038 HA12058)

SIGNAL LINE